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VOL CV

ANNUAL GENERAL MEETING

The Council hereby gives notice that, in accordance with the Bye-Laws, the Two Hundred and Third Annual General Meeting, for the purpose of receiving the Council's Report and the Financial Statements for 1956, and the election of officers and the amendment of the Bye-Laws, will be held on Wednesday, 26th June, 1957, at 3 p.m., at the Society's House.

(By Order of the Council)

KENNETH WILLIAM LUCKHURST,
Secretary.

CONFERENCE ON 'INDUSTRY AND TECHNICAL PROGRESS'

As already announced, the Council of the Society, with the British Association, is arranging a two-day Conference to discuss the Report on *Industry and Technical Progress*, which embodies the findings of the Science and Industry Committee of the Royal Society of Arts, the British Association and the Nuffield Foundation. The first session will be held at the Society's House on 27th June, when the subject will be 'Capital for Scientific Development'. Details, and tickets, may be obtained from the Deputy Secretary until 17th June. The second session will be held at Leeds on 15th July, when the subject will be 'The Supply of Scientists and Technologists for Industry'. Tickets for this may be obtained from the Secretary, British Association for the Advancement of Science, Burlington House, W.1.

PROGRAMME FOR THE 204TH SESSION

The Council will shortly be considering the programme of meetings for the forthcoming Session, and Fellows are invited to forward to the Secretary suggestions for lectures and papers by 17th June.

INDUSTRIAL ART BURSARIES EXHIBITION

The Exhibition of winning and commended designs submitted in the 1956 Industrial Art Bursaries Competition was opened at the Society's House by SIR COLIN ANDERSON, DES. R.C.A., Chairman of the Council of the Royal College of Art, on Tuesday, 21st May, 1957.

In the absence of Sir Ernest Goodale, Chairman of the Industrial Art Bursaries Board, SIR ALFRED BOSSOM, BART., M.P., a Treasurer of the Society, presided. Introducing Sir Colin Anderson, SIR ALFRED BOSSOM said:

You have not yet all had the privilege of seeing the exhibition downstairs. But it consists of the drawings submitted by the winners and those who were commended in the Royal Society of Arts Industrial Art Bursaries Competition in 1956. They were practically all students, although there are now one or two who are, of course, working in industry itself. They hope to be important designers in industry in the foreseeable near future. Bursaries are provided by firms in active commercial practice, so it is very deeply appreciated that Sir Colin Anderson has so kindly consented to say a few words about the designs downstairs and then, in due course, to declare the exhibition open.

The range of the exhibition covers almost the full scope of industrial designing; it is most comprehensive. Recognizing the intensity of commercial competition nowadays, both at home and abroad, it is obviously an exceedingly sound British national policy to prepare and equip our designers with the best possible training. The winners of these bursaries are entitled to travel to countries where it is expected that they will, and they believe they can, learn the most that will help them in their future life as industrial designers. That is why we of the Royal Society of Arts so deeply appreciate Sir Colin Anderson's generosity in giving his very precious time.

Sir Colin is nationally respected as one who has always insisted upon very good design. As a Director of the Orient Line his principles are evident in the post-War fleet. He obviously practises what he preaches. As Chairman of the Council of the Royal College of Art his guidance was invaluable in its formative years. He was President of the Design and Industries Association from 1950 to 1952. He was a Member of the Council of Industrial Design, a member of the Committee of the Contemporary Art Society, has been a Vice-Chairman of the Tate Gallery since 1952 and he received the Bicentenary Medal of the Royal Society of Arts in 1954. I think with such a record he is indeed a living inspiration to those who, in turn, will soon take charge of our national designing industry. So it is with the greatest happiness that I call upon Sir Colin Anderson to speak to us, and then, later, to declare the exhibition open.

SIR COLIN ANDERSON: Except for a brief experimental period before the War, these competitions for Bursaries have been going on only since 1946, which really is not very long. It is frightful to think that they did not begin until then when one considers that after the Great Exhibition of 1851 it was thought necessary to make a positive attempt to train designers for industry, which in fact was the genesis of the Royal College of Art. It has taken nearly a century more before we have officially, at any rate in this way, thought it necessary to send designers out of these islands as a part of what I feel to be their essential training. Anyway, it is now happening. To make it a little more official the opening ceremony is now being made an annual affair; this is, in fact, the second time that it has taken place. The first time was under the *egis* of a distinguished Minister, Sir David Eccles, and he was able to speak from two angles which are, of course, quite outside my scope. He spoke, in his then capacity last year, as Minister of Education; he was genuinely interested in getting industrial design well taught and getting it well used, so far as it is possible to do the latter, among the great body of manufacturers and business people who still are somewhat at a loss how to use, or whether to use, really highly-trained talent in this way. But he spoke from another point of view as

well, that of the Government as patron, because he had been Minister of Works during the time of the Coronation and so had been responsible for actually commissioning a number of important works from industrial designers. He showed himself at that time in many ways to be extremely enlightened, and I think we are fortunate in having had someone in both of those positions who really did share quite genuinely those convictions which I think probably everyone in this room already holds, but which are less commonly held outside it.

The bursaries are being offered to people in order that they should go abroad. To me that is of great importance. Although living on an island has done us a great deal of good in some ways, it certainly does harm in other ways as well. We are lamentably insular to this day in many aspects and there is no doubt that we are slow in tumbling to the fact that it would be a good thing if our achievements were better known outside this island. We are also very slow in feeling that it is necessary for us ourselves to know what is going on outside this island. The winners of these bursaries will, thank goodness, get outside the island and see what is going on elsewhere. That cannot possibly do anything but good—though I think I am wrong, possibly, in saying that so positively: I remember at the Royal College of Art, where we have some means of sending students abroad, we sent a young painter to Spain. He returned within, I think, a fortnight to say that he really could not stay there any longer—he found it quite unpaintable! There are these human vagaries which one must just face up to; they do not alter the fact that for most of us, going abroad is very stimulating, as I do hope all prize-winners will find as a result of this competition. We have also failed, I think, to publicize our best designers in this country. I very much doubt, for instance, whether any of our principal designers are world renowned; I do not think we have designers whose names are as well known in America, France, or Sweden as certain American, French, Swedish or Italian designers are known in this country. That is something which we must strive to change. It is rather extraordinary, I think, that although this is true of our great industrial designers it is not true of our great fine art practitioners. We have suddenly, and we really ought to be proud of it, in our midst artists both in sculpture and in painting whose works are greatly admired and bought in France, America and elsewhere, which is something which has really hardly ever happened before. Henry Moore is regarded as a first-class figure all over the world; Sutherland, also, is very highly regarded; Francis Bacon is much sought after in France and America; and Reg Butler, who was in danger of becoming a figure of fun because of the misfortune to his original maquette for the 'Unknown Political Prisoner', is now, I think, likely to achieve the extraordinary honour of having a full-scale version of it, some 300 feet high, erected in the Tiergarten in Berlin of all places, as a memorial. If that really does happen it will be a remarkable tribute to what is going on in the fine arts in this country, for these four are by no means our only internationally recognized artists.

As far as industrial design is concerned, although, as I was saying, I thought our designers were too little known by name abroad, their products, of course, are eagerly bought. Whoever they are who design sports cars, the products of their drawing-boards are being snapped up by the gilded youth of America, but I very much doubt if these young men know what the names of these designers are—I do not myself. The same would apply to aircraft and to a great number of triumphs of engineering made and produced in this country, but for some reason mysteriously, and without any blowing of trumpets. I think we are usually proud of being like that, but I do not think it is very clever to be so modest all the time.

Anyway, here is a bursary which favours the budding designer, or the budding man or woman who has already reached the stage of being in industry. I do hope that none of them, when they come into industry, will find themselves, as the designers in this country in the past have so often found themselves, smothered under a sort of anonymous cloak, as part of the firm, with only the firm's name remaining to signalize the good design which may come from one individual who should, I think, be given credit. Firms who take all the credit for the good designs of the products they put out are missing an opportunity of yet another little feather in the cap. A firm who is paying a crack designer should surely take all the advantage of that designer's name. A first-class hotel which has a first-class hairdresser does not keep the fact a secret, any more than it keeps the fact a secret that it has got a swimming bath in the basement; and I cannot see why a firm which has a good designer should not take credit for the fact.

My own interest in industrial design is of long standing. I first became positively involved over 25 years ago, when I was not all that antique myself, but luckily, having been born into a business that was still a family concern—a ship-owning business—I was given, before I was thirty, an opportunity at any rate to say what I felt about the products of this particular company. The products, in the shape of ships, were to my way of thinking very out of date in their decoration. That will not surprise any of you because it is still true, I fear, of some ships to this very day; but I did complain and grumble to my elders and betters when a new ship was to be built, that it really was intolerable our going on with *pastiche* of former forms of decoration and that we really must try to be contemporary. The answer I got, which was an extremely civilized one, from various uncles, a father, and a cousin—people thirty years older than I—was that they did intellectually agree with what I said but at the same time they knew they were quite incapable, on any level, of putting this doctrine into practice. They finally, and I think this was the most remarkable part of all, said that they agreed so heartily that I was right, that I was to be responsible for doing it myself. At the age of less than thirty, with the ship then costing over £1 million, it was rather a terrifying undertaking. It meant starting completely from scratch, not only with the design of the ship—though much of that was purely engineering and immutable—but architecturally and decoratively. In my innocence I had not realized just what it did mean. The moment you start imposing a certain language of design on to a large composite feature like a ship, you have got to make it speak the same language right through. I had not realized that when the rooms had been made modern everything else, including the table linen, the lavatory pan and the menu card, had also to be made modern. The result was, over 25 years ago, the most appalling battle for two or three years to get all this done. Those of you who are less than thirty years of age will probably find it rather hard to imagine the situation as at that date, when there was no shop with the exception of Heals, possibly Peter Jones, and one or two small and expensive specialists, where one could walk in and see contemporary design. There just was not any, for the simple reason that the manufacturers were not making it. It was not a stock object and every single one of these things which was wanted had to be fought for and created, and that was an appalling task. Some manufacturers were like my uncles whom I have already described; they observed that it was a possible thing to want contemporary design, but they had not the slightest conception what it meant, and their efforts to produce it were often laughable. All they had done was to tell the firm's designer to turn out something 'modern' and he, of course, had no more conception than they had what that meant. The results had to be turned down. In the end we found ourselves (for I must

not speak as if I had not by then an ally or two), having to find designers whom we could introduce to these great firms making crockery, carpets, door furniture, and everything else for the interior of a ship. Some firms, on the other hand took the view that we were really almost using naughty words in asking them to do things like this. It was something which they would not dream of doing and every possible obstacle was put in one's way by them, so that some other firm had to be found who would have a go at it. I mention this because those of you who were not actively living in that era will find it almost impossible to realize what a revolution has taken place in this matter and how very fortunate you are in some ways in having inherited, by now, a language of design which does match up to the era we are living in. You are not having to invent it yourselves. This language naturally, like any other language, has its poetry and its prose, it is perfectly possible to observe that. It has its idiomatic phrases which you will see in the designs by certain people, as against the flatness and platitudinous designs of other people, but they will all be, at any rate, speaking the same language and some of them, of course, in the same way that they may speak vulgarly, will use vulgar design, also within the same design-language. That is really where your training as young designers comes in. You will be trained to understand what is prose and what is poetry, and what is vulgar at the moment and what is not. That is something which was not happening 25 years ago; the movement has been so quick that one forgets that we are in a different era altogether now in this respect. I do not feel the battle is won; there are whole industries where the fact is still not accepted that good contemporary design must be put forth from within those industries. There is no need to go into details—I will let your imaginations run on this yourselves—but there are plenty of unconverted yet, although, as I say, there is an established language which can be used by those who wish to use it.

Your bursaries are, for all these reasons, of great importance and I am very glad to feel that in your 1957 Competition two new sections have been added, although two have fallen out (domestic glassware and P.V.C. plastics sheeting will not be represented). The two new ones are for the design of packaging and for typography.

Next year also the section for Film and T.V. design is to be extended: a special bursary for the theatre has been added to it. It is rather ridiculous, really, that the theatre should come last and the Film and T.V. should have come first. I had not worked out why that should be, but I fear it is symptomatic of the fact that the old-established industries are the slowest to move towards the new ideas.

I feel we all owe thanks to the companies who year after year put up this money for bursaries. They are not all groups of firms; some are individual firms, some are trade associations, and there are some individuals. For instance, Mr. George Minter personally helped over the Cinema Settings section and Sir Herman Lebus in the Furniture section, and there was a comparatively small group of contributors to the Bianca Mosca Memorial Trust.

We owe thanks also to the juries who sat to deal with all these sections, and particularly to the new juries, perhaps, who came under the chairmanship of Mrs. Mary Adams, Lord Halsbury and Lord Latham. There were, I am told, 68 jurors, all busy and distinguished people, who set the tests, judged the entries and afterwards interviewed the winners and advised them on their tours. No wonder the competition has grown both in the number of sections and of competitors, with all this talent at their disposal.

It is good to hear that really promising people have merited the awards this year in all but two sections. One of these sections was jewellery. I do not know whether you share the view I have formed on jewellery design that it is absolutely

bedevilled by the costume-jewellery flood which has overwhelmed jewellery itself. In this Jewellery section the design of costume jewellery, I am told, is not admitted. Costume jewellery is 'fashion', and is included in the Women's Fashion section. It seems to me very odd (when people like myself cannot even tell the difference between much costume jewellery and real jewellery when it is worn) that they should be completely separated into different sections in these competitions. It seems to be wrong. I am not altogether surprised that jewellery design has not flourished. I just do not think this is one of the things that is being at all well done at this moment; perhaps because jewellery is the most precious thing that can be designed, and so does not lend itself to be translated into the sort of thing (now beginning, perhaps, to be rather out of date)—the monolithic blockish modern form—which architecture and cubist painting have imposed on all the other applied arts. I think blockish, lumpish jewellery is almost a contradiction in terms and that may be why jewellery design is notably difficult to-day.

This exhibition of designs, shown downstairs, is to be shown in six other centres, Belfast, Falmouth, Glasgow, High Wycombe, Leeds and Leicester, which is good news.

Here is really an effort to do exactly what I, as a business man, feel should be done to get young designers abroad, to get them out of a rut, to let them spread their wings and to enlarge their visions, and through them the visions of all of us. So it is with really unfeigned pleasure that I can declare the exhibition open.

SIR ALFRED BOSSOM then called upon the Chairman to express a vote of thanks to Sir Colin Anderson.

DR. R. W. HOLLAND, O.B.E. (Chairman of Council of the Society): The story that Sir Colin Anderson has told us and the way in which it was told, of the difficulties facing the designer so short a time ago, only 25 years, is rather an impressive one, and with that story one can feel that the 11 years of the existence of these bursaries is quite a considerable time. Sir Colin did what I myself have longed to do many times—to try to find the point at which the fine arts meet the industrial arts. I think he did that when he told us of the recent success of a certain sculptor in designing something which was to be a memorial; those who have seen pictures of that work will feel that we are at the point where, if that is accepted as fine art, then it is very closely approaching a paradox—industrial art without function. Sir Colin is, of course, a person who knows of 'ships and shoes'. I do not know about sealing-wax! With all the business that he is called upon to do his time is most valuable, and I am sure you would not wish me to take up more of it but rather just to say how grateful we are to him for sparing time to come here and speak to us this morning and to declare the exhibition open. I should be grateful to you if you would in your usual way offer your thanks to Sir Colin Anderson.

May I add that I am sorry that the Chairman of our Industrial Bursaries Board, Sir Ernest Goodale, is unavoidably absent, but I do not think I could let this occasion pass without saying a grateful 'thank you' to Sir Ernest. He has worked hard, as Jurors will know, on this business and helped to bring it to its successful culmination in this exhibition.

A vote of thanks having been passed with acclamation, the formal proceedings then ended.

The Exhibition closes at the Society's House on Friday, 7th June. It will be open at the High Wycombe College of Further Education from 17th June for two weeks. Subsequently the Exhibition will be shown in Belfast, Falmouth, Glasgow, Leeds and Leicester; details will be given in future numbers of the *Journal*.

THE ST. LAWRENCE RIVER POWER PROJECT

A paper by

OTTO HOLDEN, B.A.Sc., C.E., D.Eng.,

*Chief Engineer, Hydro-Electric Power Commission
of Ontario, read to the Commonwealth Section
of the Society on Thursday, 9th May, 1957,
with S. D. Pierce, O.B.E., Deputy High
Commissioner for Canada in the United Kingdom,
in the Chair*

THE CHAIRMAN: As a Canadian, and as an official of the Canadian Government, I would like first to say how grateful we are for the interest that the Royal Society of Arts has shown in Canada and in Canadian matters. I do not think it is always the case that learned societies take an interest in us, because some of them seem to require as qualifications that you should have been dead at least 2,000 years and dug up at least 1,000 years ago, so they have had a chance to study you; I am afraid that Canada does not offer much that meets those qualifications! I do not think we have anything that has been dug up that long except a few musk-ox bones. The Royal Society of Arts is not interested only in the past, but in the present and in the future also; and they have shown that through their interest in the Commonwealth and in Canada; on behalf of Canada I would like to thank them for it.

You also show your interest in the future in the choice of the subject to-day, the St. Lawrence project, because I do not think there is anything more dynamic, more exciting in the history of Canadian development than in this particular project. Four years ago, and that was early, you had a lecture on the St. Lawrence Seaway and to-day you are following it with a lecture on the power aspects of the St. Lawrence project. You also show your great interest in Canada by your choice of the speaker to-day; you have chosen one of our most distinguished Canadians, Dr. Otto Holden, who has a record of achievement in the field of hydraulic engineering that has made him, not only eminent, but I can say pre-eminent in Canada and has earned him a world-wide reputation. Amongst the many things that Dr. Holden has been I can only choose a few: he is a former Councillor of the Engineering Institute of Canada, past Director of the American Society of Civil Engineering, a member of the Institute of Civil Engineering of Great Britain, a member of the American Institute of Electrical Engineering and a past President of the Royal Canadian Institute. He is now the Chief Engineer of Ontario Hydro. Ontario Hydro is shorthand for the Hydro-Electric Power Commission of Ontario, and that is (I think I have to make this point as a Federal Civil Servant) a Provincial body. We cannot take credit for it, the commission is appointed by the Ontario Government, but it is run as a separate entity; and to the great annoyance of private enterprise in Canada it is run both efficiently and at a profit. Ontario, I should explain, is only one of ten Canadian Provinces, and it is not up to me to say whether it is the most important or not. I think it is best if I adopt the attitude taken by the B.B.C. commentators before a football match when they wish all the contestants the very best of luck. But in Ontario, and indeed in Canada, Ontario Hydro does clearly provide one of the great

impulses in Canadian life. To give you some idea of its importance it is a 2 billion dollar establishment, which produces in Ontario—which has about a fifth the population of this country—nearly one quarter as much electricity as is generated in this country.

The Hydro has had another special importance in relation to the St. Lawrence Seaway which I would like to mention.

The seaway has only become feasible after a great deal of extended and very difficult negotiations in the United States. Although it has had the support of, I think, the last four, five or six American Presidents there have been opposing interests which have made the going very difficult. In those negotiations the Ontario Hydro has played a great part, and your speaker to-day too has made his important contribution. The last time I met him was in Washington during the course of those negotiations, the hearings before the Federal Power Commission. I should like to take this opportunity to pay a particular tribute to the late Dr. Sanders, the Chairman of Ontario Hydro, who was really the spearhead of the drive for the power aspect of the seaway without which the project as a whole would not have been feasible.

Dr. Holden was born in Toronto, where I think he spent most of his life. He received his Baccalaureate of Applied Science and his degree as a Civil Engineer from the University of Toronto, and in 1944 received the great distinction of having his contribution to his profession recognized by an honorary degree of Doctor of Engineering. He began his career with the Hydro in 1913 and has risen through a great many positions to that which he now occupies as Chief Engineer. He has been associated with more projects than I care to mention, for even to give you the location of them would take you up and down more Ontario rivers and streams than any one Red Indian ever travelled. Amongst the projects with which he has been associated I mention the Adam-Beck Niagara Generating Station No. 1, as it is now known, which when it was built was the largest of its type in the world. He also has played an important part in the remarkable post-war expansion of Ontario Hydro, where in seven years ten power sources were brought into production. The Ontario Hydro has recognized his contribution by naming one of its generating stations 'The Otto Holden Generation Station'. Dr. Holden's work for the Hydro, for Ontario, and for Canada has culminated in the contribution that he has made to the St. Lawrence Power Project on which he is to speak to you now.

The following paper, which was illustrated by lantern slides, was then read:

THE PAPER

When I say I am deeply conscious of the high privilege you have extended in inviting me to address you on this occasion, let me hasten to assure you that I am not using an introductory platitude. In a sense, this is like coming home. While I cannot claim this great country as the land of my birth, my father's family voyaged to Canada some three generations ago from Yorkshire.

It is pleasant for me to be in England at any time but particularly so in the spring. And, every year, when this season comes around it recalls to me those familiar lines of Robert Browning, beginning—'Oh, to be in England now that April's there'. Well, I have just missed April, but I am here in England's spring. And, I am here too, as a Canadian who is very conscious of the close ties of blood, tradition, ideals and of the Crown which are the common heritage of the British and Canadian peoples.

Canada has in common, too, with Britain the fact that its geography has contributed to the shaping of the nation. These islands have become a focal

point of history, because the sea has been both your guardian and your domain. Similarly, throughout the briefer history of Canada there runs a stretch of water, a broad and gleaming river, the St. Lawrence. When Jacques Cartier, more than four centuries ago, sailed into the vast Gulf of St. Lawrence, he thought he had discovered the fabled westward route to Cathay. The Indians gave him to understand there was no end to this marvellous body of fresh water. Samuel de Champlain, Frontenac, de LaSalle, and other great explorers and founders of New France, made the St. Lawrence and its tributaries the broad highway upon which they spread the reach of the *Fleur-de-Lis*.

The St. Lawrence has fired the imagination of poet, artist, explorer and adventurer. Its silver thread is woven inextricably into the fabric of our land. Its long and mighty arm pointed the way to the heart of a new continent. It shaped our destiny, some historians hold, for they say this river was responsible for the development of Canada east and west, rather than north and south, as was the case with the United States originally. This led, it is felt, to a different outlook and to the creation of two nations where one might have been expected to grow. What is this river of destiny?

Its basin is a great transverse valley, more than one-half million square miles in area. Its waters rise at the head of Lake Superior and flow through the sister Great Lakes—Huron, Michigan, Erie and Ontario—for these huge bodies of inland water are after all but continuations of the stream—down past great cities and towns, through falls and rapids, to glide majestically past Belle Isle and on into the Atlantic Ocean, a distance of 2,400 miles, or almost as long as the main shipping route from Glasgow to Halifax. Ocean steamships may pass 1,000 miles to Montreal, about 70 miles of canals open up the further 1,400 miles through lakes and rivers. North of this great basin is a treasure house of unmeasured wealth; while to the south are concentrated the major heavy industries of the continent.

This great river was the basis of a transportation system by which the goods of the manufacturers of the old world could be exchanged for the staple products of the new. Three points of entry from the Atlantic into the northern part of the continent existed. The Hudson river, the St. Lawrence river and Hudson Bay. Indeed, a large part of the economic history of eastern North America—especially since the end of the eighteenth century when the epoch of competitive improvements first began—could well be written in terms of the rivalry of the Hudson and the St. Lawrence rivers.

The crucial weakness of transportation on the St. Lawrence, of course, was the rapids. From the earliest days of the French *régime* the need for facilities to overcome these various rapids was apparent and small canals with a depth of two to three feet were constructed to assist the portage of canoes laden with furs or trade goods. The enlargement of these works has been a progressive but intermittent procedure for nearly 200 years until at the turn of the century we had 14-foot navigation from Montreal to Lake Ontario.

A factor which gave some impetus to the demand for better transportation facilities was the difficulties of transport from Montreal to Lachine during the

war of 1812, and as early as February, 1815, it was announced that the Imperial Government had in mind a canal from Lachine to the neighbourhood of Montreal. It is an interesting commentary on international relations that war between the two nations was an important incentive in the early conception of this project which is now being carried out as a joint undertaking by them.

Now, however, we have reached a stage of development where the present facilities of this route are no longer sufficiently adequate and only the St. Lawrence basin offers opportunity for the development of the means of transportation suitable for the products and needs of the industrial and agricultural empire in or tributary to it.

Another factor, electric power, the mainspring of our modern mechanization, has entered the picture. The St. Lawrence basin in various reaches has contributed immensely to central Canada's requirements of this vital force: at Sault Ste Marie, at Niagara and on the St. Lawrence itself.

I will not burden you with a recitation of the early investigations and reports in connection with this project except to say that their number is legion. Perhaps a word or two about the international situation may help to clarify present conditions and explain the relationship between the navigation and power aspects of the St. Lawrence undertaking. In the Canadian Section—that is, east of Cornwall—the river is a purely Canadian stream, whereas from Cornwall to Lake Ontario, in which reach the International Rapids are located, the international boundary runs through the middle of the river. For this reason, it was necessary that agreement be reached between the Governments of Canada and the United States before any change in water levels could be made.

Mr. J. F. Grandy, in his lecture before the Society in 1953, well discussed the problems affecting the use of waters constituting or crossing the international boundary. In 1952 Canada finally undertook to construct alone deep water navigation facilities from Montreal to Lake Ontario. With this commitment the United States and Canada made application to the International Joint Commission for the development of power in the International Section; the power works to be constructed jointly by the Power Authority of the State of New York and Ontario Hydro. This application was approved and plans made accordingly both for the power project and the navigation works. Subsequently, however, the United States passed legislation providing for the construction of locks on the United States side of the International Section.

In 1953 some administrative and legal difficulties remained in the United States. While the Power Authority of the State of New York had obtained a licence from the United States Federal Power Commission, to enable it to develop the power in the United States portion of the river, the granting of this licence had been challenged in the courts. The final legal obstacle was overcome on 7th June, 1954, when the United States Supreme Court upheld the right of the Power Authority of the State of New York to participate and two months later, on 10th August, representatives of New York State, Ontario, Canada and United States took part in a sod-turning ceremony which heralded the start of this long-discussed project.

Mr. Grandy, in his excellent lecture, dealt primarily with the waterway aspect of the St. Lawrence project. It is my intention to-day to cover in particular the power phase of the undertaking. However, it may be helpful to review briefly the navigation features of the St. Lawrence and Great Lakes system so that a composite picture of the whole scheme may be before you.

Before deep-draft vessels can travel the *entire* inland route however, facilities are required in five sections:

First, in the St. Marys river between Lakes Superior and Huron, where there is a 21-foot drop.

Second, in the St. Clair river section which links Lake Huron with Lake Erie, and where there is an eight-foot drop.

Third, in the Niagara river joining Lake Erie and Lake Ontario, where the drop is 326 feet.

Fourth, in the upper St. Lawrence river from Lake Ontario to Montreal. The drop in level in this case is 225 feet.

Fifth, from Montreal to the sea where there is a twenty-foot drop.

Over a period of years, Canada, as you no doubt are aware, has made important contributions to the building of an inland waterway. That contribution is represented by the dredging necessary to provide a 35-foot channel from the sea to Montreal, a 14-foot canal system between Montreal and Lake Ontario as well as the 25-foot draft Welland Canal between Lake Ontario and Lake Erie. Both Canada and the United States have built locks at Sault Ste Marie.

The real bottleneck so far as deep-draft ships are concerned, therefore, is the 115-mile stretch between Lake Ontario and Montreal where, as I have mentioned, navigation is restricted to 14 feet. To remove this limitation, Canada is constructing channels and locks to surmount the Lachine rapids immediately west of the Port of Montreal. Two locks, one at St. Lambert and one at Cote St. Catharine, are being provided to overcome the difference in level of 42 feet between Montreal harbour and Lake St. Louis, immediately upstream. Alongside the rapids between Lake St. Louis and Lake St. Francis is the power canal of the great Beauharnois Power Development. This canal is of sufficient dimensions to provide for 27-foot navigation while flight locks adjacent to Lake St. Louis will step the vessels up the 82-foot difference in water level.

West of Lake St. Francis a considerable amount of dredging is necessary to provide satisfactory navigating conditions up to the west end of Cornwall Island. Here the United States is constructing two locks and connecting channels to surmount the 82-foot rise to the headpond of the power development. Some 25 miles further west, at Iroquois, Canada is constructing a lock to bypass the control dam being constructed here for the power project; and at the Welland Canal Canada is now proceeding to deepen this channel to provide for 27-foot navigation.

To turn now to the power possibilities of the St. Lawrence, it may first be said that there is a potential of some 5 million horsepower, of which 3 million horsepower is in Quebec, 1 million in New York State and 1 million in Ontario.

One can readily appreciate the importance of the St. Lawrence river from

a power development, as well as from the waterway standpoint, when it is remembered that it is probably the best naturally-regulated river in the world. It has a drainage area at Cornwall of some 303,000 square miles, of which one-third is water area represented by the Great Lakes. With these lakes acting as regulating basins, the resulting flow in the river is, of course, exceedingly uniform. Over a period of 97 years the ratio of maximum to minimum monthly mean flow is 2:1. This uniformity of flow, combined with the large drainage area, has been one of the most important incentives towards the harnessing of the St. Lawrence river for development of hydro-electric power.

As has been stated, the development in the International Rapids Section will provide an installed capacity of 2,200,000 horsepower which will be shared equally between New York State and Ontario. At the present rate of growth, however, power from the St. Lawrence, available to Ontario, will be completely absorbed into its system as it becomes fully available. It is estimated that by 1980 power demands in Ontario may be four to five times what they are to-day, which means that resources totalling more than 20 million kW. may be required, the major portion of which will have to be provided from thermal sources.

Let us now concentrate our attention on the International Rapids Section and the power project therein. Proceeding downstream from Lake Ontario, the first work is located in the vicinity of Chimney Island, where a major dredging operation involving the excavation of 3,700,000 cubic yards is under way. Below this a large excavation is being made through Galop Island to provide navigating velocities in the Galop Rapids. The work involved in this particular area includes the excavation of some 15 million cubic yards of earth and rock. At Iroquois a control dam is being constructed across the river. In addition to the control dam, a considerable amount of excavation is necessary to reduce the velocity, and it is here also that the lock being constructed by Canada to circumvent this dam is located.

The Iroquois dam consists of 32 sluices, each fifty feet wide, which will be controlled by steel gates. Its purpose will be to regulate the outflow from Lake Ontario. For some six miles below Iroquois, further channel excavations are necessary. Then for a distance of 16 miles no channel improvements or structures are required, since the raising of the water provides ample channel width and depth to meet the requirements of navigation and power.

In the eastern section are located the major works; these consist primarily of the Long Sault Dam which stretches from the head of Barnhart Island to the American mainland and the powerhouse stretching from the lower or downstream end of Barnhart Island to the Canadian mainland.

The Long Sault Dam is a concrete structure, approximately 100 feet high and 2,900 feet long, and in plan is an arc of a circle. It is equipped with thirty steel gates, each fifty feet by thirty feet, and has ample discharge capacity well in excess of the maximum recorded flow in the river.

The powerhouse is so located that it is bisected by the international boundary and hence the Ontario powerhouse will be all in Canadian territory and the New York powerhouse all in United States.

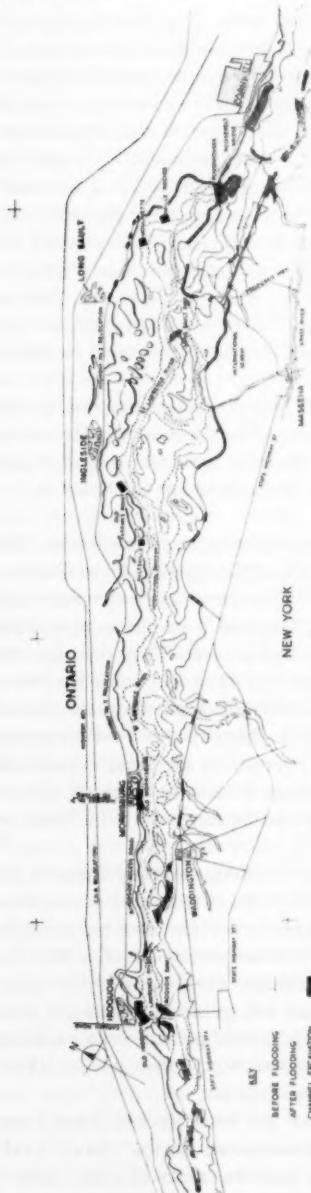
Each powerhouse will contain 16 generating units of 75,000 horsepower capacity. The powerhouse is being designed as a semi-outdoor type of powerhouse, that is, the superstructure over the generating room has been eliminated. In its stead, each unit is provided with a removable cover and will be serviced by a 300-ton capacity crane which travels the full length of the powerhouse. The upstream and downstream sides of this crane are permanently housed in, while the other two sides are provided with folding doors. When it is necessary to dismantle a unit for major repairs the crane is moved over the unit, the unit cover which is split on the unit centre line is then moved clear of the unit and the movable doors on the crane are closed. In this way the unit has protection while being dismantled, and any parts requiring major maintenance will be carried by the crane to the maintenance building at the shore end of the structure. This building also houses the control room, administration offices and reception centre.

Channel improvements associated with the power project costing in the neighbourhood of 75 million dollars are being carried on for two purposes: first, to secure a maximum velocity of 4 f.p.s. in all channels used for navigation and a maximum velocity of $2\frac{1}{4}$ f.p.s. for winter flows in order to secure an ice cover.

Perhaps a word in regard to the ice situation might be mentioned here. The ice encountered in the St. Lawrence river is largely of the type known as frazile—that is, ice in the form of needle-like crystals which occur when the water has chilled below the freezing point but is in so disturbed a condition that these crystals cannot coagulate on the surface to form an ice sheet. They then become mixed with the water and are carried downstream, and when they come in contact with the surface sheet ice, if the velocity is sufficiently high, they are carried underneath and form hanging dams obstructing the flow. To avoid the formation of this type of ice in large quantities sufficient excavations are being carried out at all points, except in the Galop Rapids, to secure a velocity at which this ice will lodge against any barrier and an ice cover can be formed by 'building' or 'packing'.

To assist in the design of the necessary channel enlargements and also in the location of the various dams and unwatering structures, models were constructed accurately to scale. These models covered three sections of the river representing in all a length of 36 miles and they reflected within one-tenth of a foot the water levels in the prototype for all flows. In addition to assisting in the determination of the distribution of flow after channel enlargements, where the river was divided by islands into several channels, they have proved most useful in the determination of the effects of various construction operations and have resulted in very material savings in the cost of the project.

To conform with the Order of Approval of the International Joint Commission, the work must be designed and constructed so that there would be no interference with downstream interests and the levels of Lake Ontario would not be affected and present 14-foot navigation would not be interfered with.



St. Lawrence River on completion of the project

The meeting of these requirements during the execution of the various phases of the work has added considerably to the problems and engineering interest in the undertaking. As I have already mentioned, the St. Lawrence river has a very uniform flow, which means that at all times a very large volume of water averaging 240,000 c.f.s. must be handled. It will, I believe, be readily understood that it required a very close scheduling of the various operations and careful planning, particularly in the unwatering of the sites for the dams and powerhouse and channel improvements themselves in order that these requirements be met. So much for the physical features of this project.

The carrying out of an undertaking of the magnitude of the St. Lawrence project obviously cannot be accomplished without affecting the lives of a great many people in the vicinity.

When construction of the project has advanced to the point where power can be generated, the gates of the Long Sault Dam will be lowered, forcing the river level to rise until a head of water sufficient to operate the powerhouses has been obtained. Present schedules indicate that this stage will be reached in the summer of 1958. This will mean that approximately 18,000 acres along a 35-mile stretch of the river's north shore will be flooded, affecting some 6,500 persons. In addition, about 225 farms will be involved, while some forty miles of double track railway line and 35 miles of highway must be relocated. Work on these latter two items is well advanced. Portions of the highway have been completed and it is expected that trains will be operating over the new line this month.

On the New York State side, 16,000 acres will be flooded, requiring the displacement of approximately 225 farm families and 500 cottage owners. Although the

amount of flooding is almost as great as on the Canadian side, it will affect an area that is much less densely populated.

The area flooded in Ontario may be divided into four main sections, namely: Village of Iroquois; Town of Morrisburg; Osnabruck Township; Cornwall Township.

In regard to Iroquois, a new town site has been developed, water, sewers, roads, power and other services have been installed. Approximately 150 houses have been moved from their old locations to agreed-upon locations in the new village and many new dwellings are being constructed by private owners. Churches, schools and other public buildings are being replaced; a business centre has been provided to replace the former commercial properties and the new village has been planned in accordance with modern principles.

For the other areas similar procedures, adjusted to suit the varying conditions, have been developed, including the creation of two new town sites.

In all about 85 per cent of the 2,300 properties required or affected have been acquired or agreements reached, and in all some 350 homes have been moved.

Work on the seaway facilities in the International Rapids Section is well advanced.

To return for a moment to the early stages of construction, it should be noted that before work on the actual structures could begin it was necessary to gain access to the several areas. This was particularly so at the powerhouse which, as already described, stretches from the Canadian mainland to Barnhart Island.

On the Canadian side it was necessary to cross the present 14-foot canal while, on the United States side, the main channel of the St. Lawrence must be spanned to give access to the powerhouse site. In the former, this was accomplished by constructing two tunnels under the 14-foot canal. The larger for the biggest Euclid trucks and the smaller for foot passage and for a conveyor belt to bring in concrete materials. The bridge from the American mainland is a major structure spanning the main channel of the Long Sault Rapids.

Now having reached the various areas let us just for a moment look at some of the construction operations. Progress to date on the various aspects of the work has been satisfactory and generally in accordance with the schedule. To enumerate a few of the main items, it can be reported that some fifty per cent of the channel enlargements have been completed, the first stage of Iroquois Dam and the unwatering of the second stage are finished, the placing of the concrete in the second stage under way. The first stage of the Long Sault Dam has been completed and the total river flow diverted from the historic Long Sault Rapids through this completed portion of the dam.

In the powerhouses, fifty per cent of the concrete in the structures has been placed and the erection of embedded parts for the generating units is proceeding. Satisfactory progress has been made on the dykes, which are necessary to contain the new headwater level.

Approximately 10,000 personnel are engaged on the power project work.

While much remains to be done, we are confident that our schedules of securing

power for the summer of 1958 will be met unless some unforeseeable contingency occurs.

No doubt many of you will have occasion to be in Canada, and to all who come I wish to extend an invitation to visit the St. Lawrence Power Project. We will be most happy to have you visit us and will do our best to enable you to secure a first-hand view of this work.

In closing, let me say that there is one prediction I have carried with me over the years. It was made by that great French-Canadian, Sir Wilfred Laurier. He looked straight at the future, when our century was but a decade old, and said: 'The twentieth century belongs to Canada'. We are behind schedule in regard to the first half of the century, with two wars and a depression, but we are moving now and gaining momentum as we go.

But this undertaking may be only another beginning. Cartier's vision led to Champlain's exploration and Champlain's dream for the St. Lawrence and its path to New Worlds beyond his knowledge. No man in his time can do more than open roads for his successors to follow, and we cheat ourselves of the adventure of living if we allow ourselves to become indifferent to this ancient truth. It is the logical continuation of the work of those who first explored this New World, and the chief lesson the pioneer teaches is that pioneering never ends.

In the Book of Deuteronomy there are these words describing to the children of Israel the promised land, which might well have been written of Canada:

For the Lord thy God bringeth thee into a good land, a land of brooks and water, of fountains and depths that spring out of valleys and hills;

A land of wheat and barley, and a land wherein thou shalt eat bread without scarceness, thou shall not lack anything in it; a land whose stones are iron, and out of whose hills thou mayest dig brass.

And finally let me say, that we welcome to our shores all people of good will and enterprise, in the hope that we may develop a bastion of democracy founded on the same principles and precepts that through the centuries have made these islands the bulwark of freedom and justice.

DISCUSSION

THE CHAIRMAN: It is my pleasant duty to propose on your behalf a vote of thanks to Dr. Holden. Dr. Holden, you have given us an enlightened exposition for which we are all grateful. Thank you for explaining to us so clearly the physical features of the project, in the course of which you indicated to us how serious and complex the problems were, but said nothing of your own share in overcoming them. Thank you, too, for telling us something about the impact of this tremendous project on the Canadian community, an aspect that is very frequently too much overlooked.

I thought that Dr. Holden showed an unusual degree of compassion toward the ordinary citizen for an engineer, but I suppose that is explained by the fact that his hobbies are gardening and swimming—an unusually happy combination for a man so interested in hydro plants! He may have in mind retiring in England. I remember occasions last summer when if you could not swim you could not garden. Thank you, too, Dr. Holden for mentioning the part played by British suppliers. They have made a very important contribution to our efforts. Like most things we

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THE ST. LAWRENCE RIVER POWER PROJECT

do in Canada, we do them better with British help. Dr. Holden, yours was a happy combination of good solid material, lucid exposition and charm of manner. Thank you very much. Dr. Holden has kindly agreed to answer questions, but I wonder if you would excuse me from the chair, which Sir Selwyn Selwyn-Clarke has kindly agreed to take over for this part of the proceedings.

A vote of thanks to the Lecturer was carried with acclamation.

SIR GILBERT RENNIE, G.B.E., K.C.M.G., M.C. (High Commissioner for the Federation of Rhodesia and Nyasaland): I wonder if Dr. Holden will excuse my ignorance and tell me how the houses are moved. Are they separated first of all from their foundations if any, and, after they are settled in their new position, fixed to their new foundations?

THE LECTURER: The procedure is roughly as follows: most of the houses are with foundations; holes are made in the foundations below the floor beams, and steel beams are inserted across the houses through these holes in the foundations. All connections between the walls and the foundations are then loosened and alongside the house a trench is excavated so that a girder may be placed under the protruding ends of the cross beams. The machine that you saw in the slide is roughly the shape of a wishbone, and at the rear end on each side there is a set of blocks operated by a motor and cables, and these pick up the ends of the longitudinal girders. At the front of the house or immediately behind the tractor portion of the machine there is a cross beam which picks up both ends of the longitudinal girders. This beam is then connected to a set of blocks at its mid point. When the house has all been freed from its foundations the three sets of blocks are operated by individual motors until all the cables are tightened and then by means of a master switch all motors are synchronized and left together. The house then is clear of foundations and the machine moves off with it. When it gets to the new location, where the foundation has been prepared, openings have been left in the foundation to correspond with the location of the cross beams. The house is then lowered on to the new foundations so that these cross beams go down into the openings left and the house rests on the foundations. Adequate structural ties are made in the new foundations into the house. The machine then moves off and the telephone and power wires are connected and people are in business again.

MR. PAUL L. DE LASZLO, O.B.E.: Would Dr. Holden tell us what is the nature of the instrument that regulates the arrangement between the United States and the Federal Government of Canada? Is it a treaty between the Federal Government or are there agreements between the State governments involved, or are there treaties and agreements involving them all?

THE LECTURER: There are agreements between New York State and the Federal Government of the United States and between Ontario and Canada, but of course there can be no formal agreement between Ontario and New York State because neither a Province nor a State is able to make an agreement with a foreign power.

Ontario Hydro's relationship with the Power Authority of the State of New York is based primarily on the order of approval of the power works by the International Joint Commission which provides for division of costs between the two power entities. This has been supplemented by memoranda and letters of understanding between these two bodies. There is no treaty between Canada and the United States; there has been an exchange of notes setting out each country's obligation and responsibility. In carrying out this work with New York State we endeavoured to divide the work that would be administered by New York and by Ontario equally, both from the point of view of dollars that would be spent and also on a manpower

basis so that each power would have control and be responsible for equal portions of the work.

MR. GORDON E. COX: I wonder if I may ask Dr. Holden to go on a little with an aspect of the subject which I know is dear to him. I am sure we are all thrilled—and many of us have a special reason to be thrilled—with the discussion and the illustrations, but I wonder if he would say—although it would be outside his official capacity, it might be within his purview as a gardener—what arrangements are going to be made to clean up this mess he has started and to make a beauty spot of it?

THE LECTURER: Ontario has already appointed a commission known as the St. Lawrence Development Commission, and in their hands has been placed the development of the area from the scenic point of view. Already they have made arrangements for a park in the vicinity of the battle field of Crysler's Farm which, while a small engagement, was a very important one in the war of 1812 in preserving Canada's British connection. This park will be some 1,800 acres in area and at various other points along the river suitable parking work will be done. I might say that on both sides of the river all the areas where excavating material is being disposed are being covered with top soil saved from the area and will be seeded and planted with trees so that we do not intend to leave an unsightly condition when the work is completed.

SIR SELWYN SELWYN-CLARKE, K.B.E., C.M.G., M.C. (Chairman, Commonwealth Section Committee): It falls to my pleasure and privilege to propose, unfortunately *in absentia*, a vote of thanks to your Chairman, Mr. Pierce. Curiously enough a year ago we had a lecture by Mr. Robert Speaight on Drama and the Ballet in Canada, and that was presided over by the High Commissioner himself, Mr. Norman Robertson. I am sure you will join with me in offering from this meeting our very warm congratulations to Mr. Robertson on his appointment as the Canadian Ambassador to Washington. He has just arrived there. I expect you may have seen as I did a little time ago a remarkable tribute to Mr. Robertson and a tribute to the service to which Mr. Pierce, the Deputy High Commissioner, belongs. It was referred to as the finest diplomatic service in the world. That is a wonderful tribute I think, and I am sure that you will agree with me that Mr. Pierce is a solid proof of its appropriateness. I would like your permission to record in the minutes of this meeting a warm vote of thanks to Mr. Pierce for presiding over Dr. Otto Holden's most interesting and beautifully illustrated lecture. I should like to end also by thanking Dr. Otto Holden myself personally for the pleasure it has given me and all of us, and also for the way in which he was able to reply to Sir Gilbert Rennie, Mr. de Laszlo, and Mr. Cox on a variety of subjects. Thank you very much Dr. Holden, and now ladies and gentlemen may I have your permission to record this vote of thanks to Mr. Pierce.

A vote of thanks to the Chairman was carried with acclamation, and the meeting then ended.

THE AIR TRAINING CORPS

ITS HISTORY AND PLACE IN CONTEMPORARY SOCIETY

A paper by

WING COMMANDER NORMAN MACMILLAN,

O.B.E., M.C., A.F.C., D.L., A.F.R.Ae.S.,

read to the Society on Wednesday, 13th March, 1957,

with C. Ian Orr-Ewing, O.B.E., M.P., Parliamentary

Under-Secretary of State, Air Ministry, in the Chair

THE CHAIRMAN: It gives me very great pleasure to have an opportunity of taking the chair at a meeting which raises matters which I believe to be of tremendous importance.

Wing-Commander Macmillan won both the M.C. and the A.F.C. in the First World War. From 1919 to 1934 he was a test pilot, and during that period he served most of the well-known aircraft companies in this country and found time to make a first attempt on a round-the-world flight for an aircraft. He also made a record: he flew from this country to Sweden in one day, which at that time was considered quite sensational. He was air correspondent for the *Daily Mail* for many years before the War and he has a background in air matters which I should have thought was almost second to none. He was a founder-member of the Air Training Corps in 1942, he was Commanding Officer, and still is, in spite of all his activities, an extremely active and conscientious Commanding Officer to the Cornish Wing of the Air Training Corps. He is also an Air Force Member—and twice vice-chairman (Air)—of the Territorial and Auxiliary Forces Association for Cornwall. He is a Deputy Lieutenant for Cornwall and he is a founder-member of the Guild of Air Pilots and was also Deputy Master. The Grand Master is Prince Philip. Here is a person who has such a knowledge of air matters that I am quite certain we are going to hear a first-class lecture. Could I say, on behalf of the Air Council, that we are convinced that in the Air Training Corps we have an organization which is of vital importance to the young people of this country and above all to the young people who want to fly with the Royal Air Force? It provides a source of recruits of the very highest calibre and we all now look forward to what Wing-Commander Norman Macmillan is going to say on this vitally important issue.

The following paper, which was illustrated by a film and lantern slides, was then read:

THE PAPER

After almost 15 years of continuous service with the Air Training Corps, if I were asked what feature impressed me as its most characteristic, I would answer unhesitatingly in the one word which forms the centre of its name—training. In my experience the great virtue of the Air Training Corps springs from its capacity to train young men educationally, physically, in

discipline, and loyalty. It does, therefore, achieve the objects laid down in the schedule of regulations of the Royal Warrant dated 23rd June, 1947, which are:

- (a) to promote and encourage among young men a practical interest in aviation and to fit them to serve their country in Our Air Force, its reserves and auxiliaries, and also in Our Navy or in Our Army;
- (b) to provide training which will be useful both in the Air Services and in civil life;
- (c) to foster the spirit of adventure, to promote sports and pastimes in healthy rivalry and to develop the qualities of mind and body which go to the making of a leader and a good citizen.

I have heard the commanding officer of an Air Force Station say he could almost always tell when one of his airmen had been an A.T.C. cadet; for there was about his bearing, appearance, and manner an indefinable polish that marked him out as having received pre-Service training during his youthful formative years.

WING INSPECTION

A.T.C. Wings have few opportunities of composite parades. For the annual Wing Inspection, squadrons meet at the place of inspection, and may not again meet until the next year. They are sorted out on the parade ground into a pattern suitable for a Wing parade. Three composite squadrons may have to be created from some 17 Units which are usually geographically separate. No rehearsal is possible. Royal Air Force officers have expressed astonishment that these parades are performed efficiently, for practice parades would be held for three weeks before a similar inspection of the regulars of an R.A.F. Station.

One secret of the success of the Air Training Corps is the immense pride the cadets take in their performance. Cadet non-commissioned officers are accustomed to drill squads of younger cadets. Officers know drill procedure, for all have received instruction, and have qualified at the Course for officers of the Corps, which is designed to give them the necessary knowledge of drill and administration. The Wing Headquarters is responsible for the parade orders. These are drawn up in complete detail well in advance and distributed to every Unit. Each Unit knows beforehand which composite squadron it will belong to, and where that squadron will be stationed on the parade ground. Instructions accompanying the sketch plan include every verbal command which will be given. On the day of inspection everything falls tidily into place.

Whenever possible Wing Inspection parades are held on a Royal Air Force Station. They cannot all conform to a set pattern, because circumstances vary in different Wings. Middlesex Wing (the stronger) is about 1,750 strong, Hampshire about 1,409, Bristol and Plymouth city Wings have about 500 cadets, Cornwall about 600. Facilities for assembling vary. City Wings can muster, possibly by public transport, on a Saturday afternoon. A county Wing such as Cornwall can parade only on a Sunday with hired transport, and the whole day devoted to the parade and its associated features.

Officers and cadets must find their own means to reach the squadron assembly point. Some cadets rise about six and after an early breakfast cycle several miles

to the motor coach. In Cornwall some coaches have to travel about fifty miles to the Air Station. All must be 'debussed' there by ten o'clock. This allows time for a cup of tea and a biscuit before the fall-in, and one is always grateful to the NAAFI for providing such really necessary, even if simple, essentials to a good parade.

UNIFORMS

Cadets receive a free loan issue of greatcoat, tunic, trousers and beret, but no issue of socks or shoes. Regulations require a cadet to wear the black shoes (or boots) which are standard with Air Force uniform. But some boys have only brown shoes (or boots), perhaps only one pair. All are warned that black footwear must be worn. Some years ago—these Wing Inspections began in 1947—quite a number of cadets fell in wearing brown footwear. Nelson's telescope had to be used, or the parade numbers would have been seriously reduced. After a few annual warnings, offenders were ordered to fall out, and parade on the sidelines with new recruits who had not received uniform. The lesson has gone home—in a literal sense—and to-day one might find perhaps two cadets in 300 who offend military sartorial etiquette.

But that ruling may not have had much effect on retail sales of black shoes in local shops. Because I suspect, in a good many cases, heavy applications of black boot polish were used to convert brown shoes into black. And in so doing cadets acted with wisdom and economy, and on good authority, for once I was issued with a pair of officers' shoes from R.A.F. sources. After brief wear the veneer wore off and disclosed them to be brown *veltshoen* made in South Africa.

RELIGIOUS INSTRUCTION

Close attention is given to religious instruction in the Air Training Corps. Wing Inspection Parades always begin or end with a Drumhead Service. I have never found any difficulty in combining Anglican and United Board denominations. Cornwall Wing has held ten annual Wing Church Parades, alternating between Anglican and Methodist churches, in a different town each year. They are not compulsory. Distances and cost of transport have kept down numbers, but usual attendance has been about thirty to 35 officers and warrant officers and 300 cadets, from fifty to sixty per cent of total strength. For most it means a very early start and equally late dinner. There have been no special attractions, just the assembly and march to the church; after the Service, the march through the town, band playing, past the saluting base, to dispersal. Yet many cadets have said they would not like to miss these combined church parades.

At Wing Inspections the Drumhead Service lasts perhaps 15 minutes, less than the time taken by the inspecting officer to walk round the ranks. Usually, the Wing Chaplain (Anglican) conducts the Service, assisted by the Station Chaplain, or by a Methodist Minister, who may be either the Wing Chaplain (U.B.), or a chaplain of one of the squadrons. Each squadron has an Anglican Chaplain, and many have a United Board, or other denomination, Chaplain also. The Bishop and Chancellor have given the Address to cadets in the

cathedral; the Chancellor has also officiated in the Drumhead Service. Chaplains visit cadets in camp at R.A.F. Stations. In some squadrons regular visits are made by the Squadron Chaplain while cadets are under instruction at squadron headquarters. Officers may attend the Church of England R.A.F. Moral Leadership Course, and those who have speak highly of its value. I believe these aspects of A.T.C. religious training have a deep moral value because of teenage corporate worship.

GUESTS

If the Wing Inspection is held on a Royal Air Force Station, it is followed by luncheon for the officers and their guests in the Officers' Mess, which the Station Commander and the President of the Mess Committee kindly assign to the A.T.C. for the occasion. Warrant officers are received in the Sergeants' Mess, cadets in the Airmens' Mess. Charges for meals are modest in every case.

Guests of note are invited to Wing Parades. The Lord Lieutenant may be present, and take the salute. Members of the Wing Committee, chairmen of squadrons, their wives; mayors and mayoresses, senior R.A.F. officers, civic and county dignitaries see the Corps, as represented by the Wing, on parade. Parents have an opportunity to see the organization their sons belong to. The R.A.F. and A.T.C. get together, and arrive at a better mutual understanding of what each is aiming at, and how their reciprocal targets can be brought into focus.

During the afternoon parties of cadets, parents and guests tour the Station with R.A.F. officers and N.C.O.s. as conductors. The Station cinema shows films specially selected for the cadet audience, often of R.A.F. origin not ordinarily viewable in public cinemas. There may be shooting on the rifle range, instruction in the Link Trainer, entry into the Flying Control Tower, talks on the work of Air Traffic Control. Best of all to the cadets is their opportunity for a flight in Service aircraft.

FLYING

Formerly *Dominie* and *Oxford*, and now *Anson* aircraft have been used to give cadets air experience. These aircraft visit scheduled R.A.F. Stations at intervals, and A.T.C. Wing Headquarters allots flying time to squadrons. But a special programme is often arranged for the annual inspection, with the object of giving every first class and proficient cadet a flight, and perhaps probationer cadets their initial air experience. Sometimes operational aircraft add to the air lift, and then every cadet present, and possibly all their officers, may be airborne.

Through its flying for cadets the Royal Air Force is undoubtedly contributing to the making of an air-minded nation. Flying is the jam that sweetens the pill of the hard work demanded of cadets in squadron classrooms, where mathematics, electricity, theoretical navigation, stellar charts, aircraft recognition, engines, tools, airframes, theory of flight, and other serious study subjects pack the syllabus of training and give the A.T.C. its high value as a post-school or extra-to-school educational organization. But flying has greater value than sugar coating. Flying demands discipline. That discipline is not always easily dis-

cernible, because aircrews have a wonderful ability to disguise it with a seeming casualness that is mere veneer. Cadets sense that discipline as a controlled concentration, without which no pilot can properly handle an aeroplane, and no aircrew can perform its duty as a team. Through this contact cadets realize that discipline, self-discipline, must enter into every aspect of life if they are to make a success of what they strive to do. The understatement symptomatic of the Englishman is but his partially successful attempt to camouflage pride in his innate sense of discipline. I met a German colonel who visited London about 1936 and saw the changing of the guard at Buckingham Palace, the Horse Guards, and the Tower. He afterwards said to me: 'You may not be a military people, but you are a martial race'. That officer ended the Second World War as a major-general in the Wehrmacht, and he probably felt that his earlier opinion had been confirmed. I believe this same feeling is inculcated in the cadet by contact with the Royal Air Force; and at his youthful age it is a powerful stimulus to the building of character.

TRAINING

At a time when aviation has assumed first place in defence, girdled the world for transport, mails, and commerce, and opened up new areas of undeveloped land, it is important that our youth should grow up with knowledge of the air. For their contact with and knowledge of the air will assist the United Kingdom to continue to be one of the great air nations, as in the past she became and remained a great maritime nation through the ready contact of her people with the never-distant sea. No organization, other than the Air Training Corps, has ever given Britain's youth such contact with aviation. Through its network of squadrons and flights it carries this work into almost every small town in the Kingdom. Its spread is as wide as secondary-school education, and it supplements that education by giving instruction in aviation theory and practice to young men who leave school at the lowest statutory age. Through this work the Air Training Corps makes an important contribution to contemporary society by increasing the human factor which this country needs in order to retain its proper place among the air-faring nations.

It is important to the Royal Air Force, and to the Merchant Air Force, that a considerable body of air-minded and air-educated youth should form a good cross-section of the younger generation each year. For whatever the tendency towards greater development of military robots and ballistic missiles, there must be a period during which manned aircraft will continue to be required. It is not certain that surface-to-air guided missiles can altogether displace manned fighter aircraft. Manned maritime aircraft cannot be replaced by robots while a submarine threat exists, neither can manned military transport aircraft while human passengers, and light and valuable freight, have to be carried by air. Looking ahead, one can see the nuclear-powered aircraft of the future, with an immense duration and electronic jamming, and equipped with air-to-air and air-to-surface guided and self-homing weapons, perhaps replacing and certainly implementing naval surface and underwater missile ships, and it will be a manned aircraft. Neither is there any near prospect of robot civil transport aircraft,

except possibly for express mails. So the demand for air crews for both military and civil aviation will continue for a long time to come, certainly for as long as the air-aspirating engine (with supercharger or compressor) continues to be used, or the atmosphere is the reacting medium for providing lift. And the increasing technicalities of crew training will demand that initial instruction at an early age should prepare the way for subsequent advanced study.

The fact that schools have recently been authorized to include in their curriculum specific aviation subjects, such as navigation mathematics, is evidence of the growing realization of this need. But schools cannot provide more than theoretical approach to certain branches of aviation basic study. By contributing what the schools leave out the Air Training Corps (and the R.A.F. Sections of the Combined Cadet Force) provide youth with something which is otherwise difficult to get, costly, or even unobtainable in contemporary society. To a certain degree these advantages must be sought by the individual. He must work for them. They are not necessarily achieved by all, but they are open to all, and it is certainly true that the keen seeker will find what he desires.

HOME AND OVERSEA TRAVEL

Apart from one week's summer (or Easter) camp on a Royal Air Force Station, which can be an education in itself, and opportunities of day visits to such stations six times a year, travelling free and with low charges for messing, the A.T.C. cadet can fly in a variety of ways. In addition to familiarization flights in communication aircraft, he may fly as supernumerary aircrew when at summer camp. I have known cadets fly to Ringway (Manchester), thence to Leuchars (Fifeshire), thence to Hawkinge (Kent), and so back to their camp airfield in Wiltshire in one day. I have known of cadets flying on routine flights to mid-Atlantic and back. Since December, 1949, about forty selected cadets have travelled monthly as Assistant Air Quartermasters in Transport Command aircraft to Germany, Malta, Libya, Iraq, Pakistan, India, Nairobi, Singapore, Hong Kong. Other selected cadets have flown to Norway, Denmark, Sweden, Holland, France, Italy, Canada and the United States under reciprocal arrangements with the corresponding cadet organization oversea. It is only because the cadet organizations in these countries are affiliated to their Air Forces that such transport facilities became possible. Each party of cadets in each country engages on a programme of planned interest from the moment of its arrival. British cadets visiting Canada or the United States may travel the breadth of the continent, to the Pacific. Often they are the private guests of families, some of wealth. These young men, on the threshold of adult life, experience foreign travel under conditions that far outrival luxury tours costing large sums. It costs them nothing but the little pocket money they care to take. And it should be remembered that these fortunate cadets are drawn from a wide cross-section. I have known the son of a poor widow chosen for a reciprocal visit. Cadets are specially kitted in smart uniforms before departure; they go as young ambassadors of their countries; they return with new knowledge of the world, of educational value, gained at first hand.

PILOTAGE INSTRUCTION

Instruction in pilotage is available to efficient cadets from the age of 16, in both gliders and powered aircraft. The A.T.C. gliding organization is the largest in the world. Operated by volunteer commissioned and civilian instructors it enables cadets to gain their 'A', 'B' and 'C' international gliding certificates. Flying scholarships each worth £150 enable cadets to qualify for the Civil Pilot's 'A' licence at flying clubs. Graduates are afterwards awarded the appropriate gliding and flying badges to wear on their uniforms.

During 1951, 689 cadets were given oversea flights, 351 flying scholarships were awarded, and 1,221 cadets qualified to fly gliders; 8,298 ex A.T.C. and C.C.F. cadets joined the R.A.F. for ground duties, and 1,057 as aircrew. By the end of 1953 over 1,000 cadets had been taught to fly light aircraft, and during that year 1,386 cadets reached gliding proficiency standard and 45 had passed the advanced test. By mid-1956, six years after the scheme began, 1,614 cadets had qualified as 'A' licence pilots; about 400 had failed to qualify, or did not complete the course.

Parents' or guardians' consent is a pre-requisite to cadets' flying. But there have been very few accidents. Once two cadets were lying on their stomachs looking out of the plastic window of the bomb-aimer's panel, no doubt picking out landmarks and imagining themselves aiming. Suddenly, at about 1,800 feet, a buzzard collided with the Lancaster's nose. The heavy bird broke the plastic panel into several pieces and itself came through it. Pieces of plastic and bird tore two deep gashes in the right cheek of one cadet. Blood spurted from a severed artery where the cheek was cut through to the mouth. Instant action was taken within the aircraft. An R.A.F. sergeant tore open an emergency gauze dressing, clamped it on the cadet's wound, and bound it in place. Air Traffic Control cleared the airfield for an emergency landing. The ambulance driver started his engine. Sick Bay was warned.

Two minutes after the accident the cadet was in the ambulance on the way to the sick bay. The duty medical officer was a Czech. He operated at once. Although the sergeant had no medical knowledge, the medical officer said he had, by the happiest chance, applied the dressing in the one way which could stanch the bleeding. Had he not done so, the cadet would have succumbed to loss of blood before reaching the surgeon's hands. With a saline transfusion feeding into the cadet's left arm, the medical officer skilfully removed the pieces of plastic and bird from the flesh, and cleaned, and sutured the wounds. He gave the boy a fifty-fifty chance. He gave permission for the parents to see their son for about two minutes. The Wing Commander drove twenty miles to their home and brought them to the airfield. The father was employed on the railway, and he and his wife were extraordinarily brave about it all. The boy made a remarkably quick recovery, and the accident did not deter him from his intention to enter the Royal Air Force.

In 1944, when flying bombs were falling on London, cadet gliding in the approach and target areas was stopped. But instructors could continue to fly.

One, while in flight, heard a V.1 approaching. Thinking he would look closer at it he turned towards its path. As the robot came on he saw he would have to turn steeply away from it. His upturned wing received a sudden additional lift from the hot stream from the pulse jet engine. This turned the glider upside down. It stalled and spun inverted. Before its pilot could recover to normal flight the glider hit the ground. He was lucky to escape with relatively minor injuries, but still walks with a limp.

On 13th August, 1951, a Wellington flying instructionally from an Operational Conversion Unit collided in mid-air. It began to break up, and plunged out of control. A cadet was a passenger, flying in the rear compartment with Flight Lieutenant J. A. Quinton, D.F.C., a navigator under instruction. Quinton picked up the only parachute within reach, clipped it on the cadet's harness, pointed to the rip cord. At that moment the cadet was flung through the side of the aircraft where a new hole appeared, probably sucked out by the airflow, clutching his rip cord handle. He pulled it, and alighted safely, the sole survivor, thanks to the Flight Lieutenant's speed of action and self-sacrifice. Quinton was posthumously awarded the George Cross. The Air Training Corps subscribed to a Quinton Memorial; a silver-mounted stick. It is kept at Halton Air Station, and a small replica is awarded annually to the best Halton apprentice.

PHYSICAL TRAINING

Physical health is an objective of the A.T.C. The cadets receive lectures on personal hygiene. There is a full programme of games and athletics, organized on inter-squadron, inter-wing, and inter-area (that is, national) level. Boxing is carried through to A.T.C. national championships. Shooting, on indoor .22 ranges, and on .303 outdoor ranges, teaches the qualities of marksmanship, and cadets can gain a marksman's badge. Shooting is supervised by officers and warrant officers of the Corps, but only after they have passed the range course. Games, athletics, boxing and swimming are organized by sports committees functioning at each level. Physical fitness officers deal with the routine at Area and Command levels; at Wing level a training officer is responsible; squadrons operate their own organization and vary considerably in their devotion to this aspect of A.T.C. training, in direct ratio to the enthusiasm of the officers and the local facilities for training: school squadrons (as might be expected from their built-in facilities) produce the outstanding results; open squadrons containing a large number of senior school boys also do well.

The fewest changes in the A.T.C. have occurred at squadron level. After the Second World War the age of entry was reduced from 15½ to 14.* There have been improvements in instruction and accommodation, and in quality of officers and cadets. Six changes of importance have taken place higher up, and it would be unwise to prophesy that the present chain of administration is more permanent than its predecessors. The remarkable feature of the A.T.C. is that squadrons can and do function whatever happens above, provided a certain minimum

* In each case a probationary period of three months was obligatory before the issue of uniform. In April 1957, the age of entry was reduced to 13½, but this involved a period of nine instead of three months on probation before issue of uniform.

of financial lubricant is conveyed to them, their objectives in training are clearly defined, and an ultimate aim indicated. This flexibility at squadron level is a great source of strength in the A.T.C., and it indicates that the original conception of the working squadron was sound. But the closest possible association with the Royal Air Force has always proved the best stimulant.

THE AIR DEFENCE CADET CORPS

In July, 1938, the Air League of the British Empire launched the Air Defence Cadet Corps, with 20,000 cadets as the objective. The Air Ministry supported the venture by a small annual grant of 3s. 6d. for each efficient cadet. The League was able to assist squadrons financially only in a small way. Funds had to be raised locally to start a squadron. Thus local committees had to be formed, who were responsible for the squadron. In this way the Corps started as a civilian-controlled organization. Officers were selected by the committee, commissioned by the League, and found their own uniforms. It was intended that the only charge on cadets would be 3d. a week for upkeep of kit, but some paid for their own uniforms, and others were assisted by the committee. There was no remuneration. No personal expenses were paid. It was estimated that squadrons would cost about £150 to £200 a year plus £130 initial outlay for uniforms. The League laid down training programmes, but no examinations, and did not try to force squadrons into a common mould. Flying training formed no part of the normal instruction. Drill training was without arms. The first syllabus of training was issued in August, 1939; it contained four parts—first year basic training, aircrew training, trade training, and additional subjects of common interest. Retired R.A.F. officers were appointed in various areas to act as organizers and to maintain liaison between squadron committees and the League.

Air Commodore (now Sir) Adrian Chamier was then Secretary-General of the League, and so chiefly responsible for founding and administering the Corps. Marshal of the Royal Air Force Sir John Salmond was its first Chairman.

Officers' uniforms were of standard R.A.F. cloth and Field Service Dress pattern except that rank was denoted by silver braid, buttons were of chromium, trousers had turn-ups, and badges were Air League design. Cadets wore a patrol jacket with double collar, and chromium buttons bearing the letters A.D.C.C. above the Air League albatross flash symbol, trousers without turn-ups, and a forage cap of which badge was a circlet bearing the Corps' full name with the League flash in blue enamel across its open centre.

No. 1 Squadron was established in July, 1938, at Leicester. The joint headquarters for Nos. 2 and 3 Squadrons was officially opened at Watford by Sir John Salmond on 15th October, and in that month No. 4 Squadron was formed at Ilford by the Mayor, and before the year's end No. 24 was formed in Penzance by the Lord Lieutenant of Cornwall. No. 57 was formed at Potter's Bar in February, 1939. The first fifty squadrons suffixed the letter 'F' for founder to their number, and this distinction still continues in the A.T.C.

Many of the officers and instructors entered the Services when war began

in 1939 and their places had to be filled. By the end of 1940 some 20,000 cadets were enrolled in about 200 squadrons.

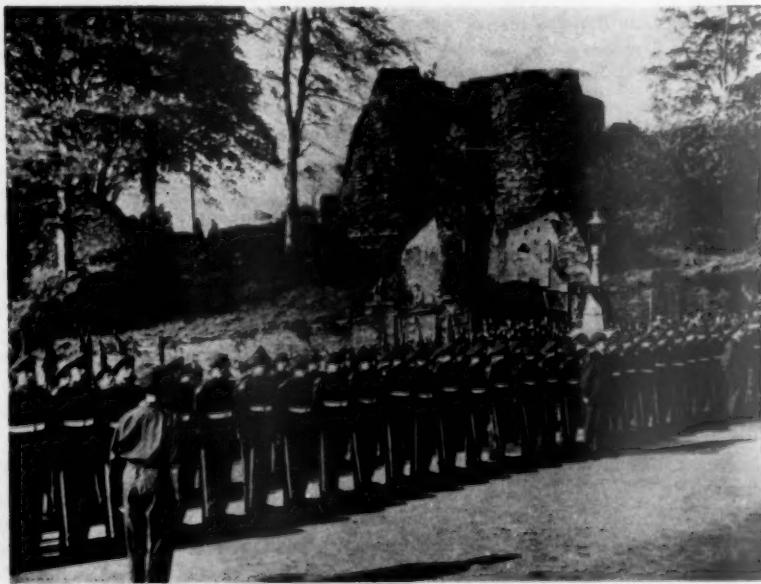
THE AIR TRAINING CORPS

On 9th January, 1941, Sir Archibald Sinclair, Secretary of State for Air, announced the impending formation of the Air Training Corps. It came into existence on 1st February, 1941. The first Royal Warrant, dated 4th February, read:

Whereas We deem it expedient to provide for Our Youth the means of preparing themselves for air service in Our Air Force or in its Reserves or Auxiliaries or in the Fleet Air Arm of Our Navy . . . there shall be established a Corps to be entitled the Air Training Corps.

His late Majesty King George VI assumed the title of Air Commodore-in-Chief. An A.T.C. badge, crest and ensign received Royal approval. On the death of The King, His Royal Highness The Prince Philip, Duke of Edinburgh, became Air Commodore-in-Chief.

Almost all A.D.C.C. squadrons were embodied in the A.T.C., retaining their original numbers. A Training Branch of the Royal Air Force Volunteer Reserve was created, in which officers were commissioned for service with the A.T.C., thus becoming subject to King's Regulations and Air Council Instructions and Air Force Law. These officers were (and are) selected by methods similar to those that apply to regular candidates. They wore standard R.A.F. No. 1 Field



[By courtesy of the Air Ministry]

The first Royal Guard of Honour ever to be mounted solely by the A.T.C. for the Sovereign, on the occasion of the Royal visit to Launceston, 9th May, 1956



[By courtesy of the Air Ministry]

The Queen inspecting the Royal Guard of Honour at Launceston. The Duke of Edinburgh is seen to the right of Her Majesty, walking beside Wing-Commander Macmillan

Service Dress with the brass letters 'VR' on the lapels; navy blue cloth discs 1½ inches in diameter embroidered with a light blue circle one inch in diameter and containing the similarly embroidered letters 'A.T.C' were worn on the outside of the sleeve immediately above the rank braid. They were unpopular, and nicknamed 'soup-plates'. It is difficult to know why they were so unpopular—perhaps it was some psychological reaction to their unsightliness, for they were extremely ugly, a bad fault in a uniform.

Training Branch officers were not authorized to wear No. 2 War Service Dress, commonly called 'battle-dress'. Embodied Volunteer Reserve officers were instructed in 1943 to remove the 'VR' brass letters from their uniforms, but Training Branch officers were instructed to continue wearing them. Training Branch officers were not authorized to wear peak caps, but only forage caps. Possibly all these variations in dress regulations culminated in concentrated hatred of the 'soup-plates'. Eventually the hatred had effect. In 1944 the cloth discs were abolished, and in place of the 'VR' letters the circlet, falcon and motto of the Corps' crest, in gilt metal, was worn on each lapel. This ornamental badge, although more prominent, was popular, and there was regret when it in turn was replaced after the war by the currently used drab letters 'ATC' in brass. Then, too, the regulation uniform for officers became No. 2 Home Service Dress, that is, battle-dress.

The A.D.C.C. cadet's uniform was slightly modified. Chromium buttons bore the letters 'A.T.C.' above the Corps' falcon. The cap badge was the A.T.C. circlet and falcon. The patrol jacket was retained, but with an attached R.A.F.-type cloth belt and buckle in place of the 'cricket'-type separate belt of the A.D.C.C. To-day, with the prevailing collar-and-tie attitude in uniforms, there is a desire for a change to 'battle-dress'. That would almost certainly call for the issue of standard shirt, collars, and tie, which at present are not required. For several years cadets were not issued with greatcoats, and had to wear civilian overcoats in bad or cold weather.

HIGHER COMMAND

Air Commodore Chamier, recalled at the outbreak of war, was posted to Balloon Command as air officer in charge of administration. With the creation of the A.T.C., he was appointed its Chief Commandant. Mr. (now Sir) J. F. Wolfenden, then headmaster of Uppingham School, was appointed Director of Pre-Entry Training, and secured wide support in the educational field. In 1942 Flight Lieutenant (now Sir) W. W. Wakefield, the former R.A.F. Rugger captain, was appointed civilian Director of the A.T.C., and Chamier became its Inspector. In 1944 Air Marshal Sir Leslie Gossage became Chief Commandant and Director-General of the Corps, and held this appointment until 1946.

A standing Committee of the Air Council, with the Parliamentary Under-Secretary of State for Air as chairman, was set up in 1941 without executive powers, to deal with major policy decisions and to keep the general development of the Corps under review. A separate Standing Committee was set up for Scotland. Subject to the usual overriding control of finance and the authority of the Standing Committees, policy direction and responsibility for the Corps was vested, under the Member of Air Council for Training (afterwards, following changes in the Air Council structure, under the Member for Personnel) in the Chief Commandant or Director. (Warrant officers of the Corps were recognized by Warrant of the Chief Commandant, and did not—nor do they now—wear The Royal Arms rank badge unless previously entitled to it.)

A Central Council of Welfare, and Educational and Chaplains Advisory Committees were established.

The country was divided into eleven Command areas each with a Commandant responsible to the Chief Commandant. Each Commandant had a small full-time paid staff, part commissioned, part civilian. Volunteer District Inspecting Officers were his part-time liaison staff officers for a county or a city. They sorted out problems on the spot without executive authority. Their work could be accomplished only on a basis of good will and tact, so they had to be chosen with care. Commandants were usually retired senior R.A.F. officers, who were granted a small honorarium and expenses. District Inspecting Officers received only travelling expenses that never covered the cost, and which some did not claim; their number included peers, admirals and baronets.

Some areas or counties formed Committees to co-ordinate the Corps' activities.

They were recognized bodies, but had no executive authority. They could not be set up without the Commandant's approval. In their advisory function they drew together men of standing in local government, education, employment, the churches, chairmen of squadron committees, and gave valuable service and guidance to the A.T.C. within their area. These Committees were not officially recognized in the post-war Regulations issued in June, 1951. Some have since continued without such recognition, but others have died out. One feels that they should again be placed on an official footing, and given a definite status in the organization between Squadron committees and the Air Cadet Council.

The committees of A.D.C.C. squadrons were taken over, and in the A.T.C. such committees became (and still are) pre-requisite to the forming of new Open squadrons. During the war a squadron required a minimum of 100 cadets, a flight fifty cadets, a section 25 cadets. (To-day, all A.T.C. units are termed squadrons except detached parts of a squadron which are termed flights. Minimum strength for a squadron is now 25 cadets.)

WARTIME TRAINING

Meanwhile the Empire Air Training Scheme (which was signed three months after the outbreak of war to provide training in airmanship in the United Kingdom, Canada, Australia, New Zealand and subsequently in the United States) had got into gear. The training of pilots, navigators and bomb-aimers took the longest time. Air-gunners and wireless operators could be trained much more rapidly. Pre-entry training for the PNB Scheme (as it was called) became one of the chief aims of the best A.T.C. squadrons. This training shortened the time needed in the R.A.F. Recruit Centres and the Initial Training Wings, and throughout the several courses. Service familiarization helped the young men to get over the first strangeness of Service life. It is difficult to assess the time saved by the A.T.C., but it was considerable, and played a useful part in the total war effort. This applied not only to PNB, but to the other categories of aircrew, and to ground tradesmen.

By VJ-Day the A.T.C. had enrolled nearly 500,000 cadets. The wartime peak strength was reached in 1942 with 210,000 cadets. June, 1944, saw the other categories' peak figures of 8,939 active officers, 1,485 warrant officers, and 1,750 squadrons. During the war about 170,000 trained A.T.C. cadets entered the Services, over 100,000 joining the R.A.F. Over 500 ex-cadets received awards for gallantry, including one V.C. awarded posthumously to Acting Flight-Sergeant A. L. Aaron, D.F.M., the R.A.F.V.R. pilot of a *Stirling* bomber. In the summer of 1942 a great rally of about 10,000 London cadets was reviewed by the Secretary of State for Air and Members of the Air Council in Hyde Park, and a contingent was inspected by The King at Buckingham Palace the day before.

In August, 1944, the aircrew pool was greater than could be absorbed, because aircrew training had proceeded faster than had been thought possible, while casualties had simultaneously dropped with the increasing pressure on the Luftwaffe. Some trained pilots were transferred to the Glider Regiment to

fly gliders and fight as ground troops after landing; others were transferred to purely ground duties. A.T.C. cadets found entry into aircrew suddenly contract. Initial Training Wings began to close down. Young men who had qualified in the A.T.C. were called up and diverted to the Army, or directed into the coal mines. The effect on morale of this sudden removal of the chief aim of the Corps was severe. Squadrons began to run down. The lowest in morale faded out altogether when the war ended; some have never been revived; some were held together in *cadre* form for two or three years before they could be reorganized on a sound basis; others had to await a change in local outlook before being re-started with completely new participants.

POST-WAR ORGANIZATION

For a period the future of the A.T.C. was uncertain. But before 1945 ended the Air Council decided to form an R.A.F. Reserve Command, and to place the A.T.C. under it. Early in 1946 the A.T.C. Commands were replaced by seven (later six) Groups of Reserve Command (renamed Home Command in 1950). Maximum peace-time cadet ceiling was provisionally fixed at 75,000. The Air Officer Commanding-in-Chief became Chief Commandant and Director-General of the A.T.C., and Air Officers Commanding Groups became Regional Commandants. On 23rd June, 1947, the second Royal Warrant redefined the objects and composition of the Corps, and introduced the obligation to train cadets as good citizens. In that year A.T.C. wings were established, commanded by volunteer officers, with a very small permanent staff, including an adjutant, at first a regular officer, but from early 1951 a civilian adjutant employed on Class J Reserve. Fifty-one Wings* covered the United Kingdom and Northern Ireland. Their commanding officers absorbed the work of the former District Inspecting Officers, and the Wings provided a sound chain of command. Through the new administration everything became more closely knit to the R.A.F. Regular R.A.F. officers and N.C.O.s. voluntarily instructed A.T.C. squadrons where such aid was needed. The efficiency of the Corps rose steadily, right down to the quality of the individual cadet and his training. The wartime administration courses for Training Branch officers and warrant officers were centralized in one school, which (since 1952) must be attended and passed before initial promotion. Tenure of commissions, previously without limit, was set at renewable periods of four years. The gliding schools were reorganized, almost one to each Wing; later they were reduced to 21, and may be centralized still further; this has not reduced the number of cadets qualifying, but squadrons remote from gliding schools suffer from reduced instruction, while more fortunately-placed squadrons arbitrarily gain.

Squadrons' wartime headquarters were often sited in delapidated or bomb-damaged buildings. They were moved to better accommodation, or provided with huts. In 1952, local responsibility for repair, maintenance and construction of A.T.C. buildings (except those on Air Stations) was vested in the Territorial

* Now fifty Wings.

and Auxiliary Forces Association. But a proposal to put the A.T.C. wholly under the administration of the T. & A.F.A. was not accepted by the Air Council. A later proposal to revert the Corps to a quasi-civilian form of higher control, resembling the wartime system, was also unacceptable. In 1951 the Air Council established an Air Cadet Council and a Scottish Air Cadet Council in place of the two A.T.C. Consultative Committees, with the Parliamentary Under-Secretary of State for Air as President. Consultative Committee meetings held at Groups' headquarters provided a link between Squadron chairmen and the Air Cadet Council. At the beginning of 1957, when Home Command Groups were reduced to two, control of the Corps through Groups ceased. The Air Officer Commanding-in-Chief, Home Command, now carries the additional title of Commandant, Air Training Corps. His Headquarters has a special staff to deal with the A.T.C. direct; the status of Wings has risen accordingly.

With the creation of the Combined Cadet Force in 1948, some A.T.C. School Squadrons began to transfer to the C.C.F. In the summer of 1949 there were about 44,000 cadets in the Corps. Transfers and elimination of low quality Units and cadets has reduced numbers. At the end of 1956 the A.T.C. strength was 3,228 officers, 851 warrant officers, 1,675 civilian instructors, and 32,493 cadets, organized in 51 Wings and 672 Open and 84 School squadrons. During 1956, 24,286 cadets attended camps at R.A.F. Stations; 26,402 cadets were airborne; 86 made oversea flights (84 fewer than in 1955 and 215 fewer than in 1954). In 1956, 220 cadets won flying scholarships and 134 qualified; 1,618 'B' (proficient) and 74 'C' (advanced) gliding certificates were awarded.

Technical training is divided into basic, aircrew, fitter, and radio trades. Cadets who pass basic training wear a star arm-badge as first-class cadets; those who pass the proficiency examination (and are thereby guaranteed acceptance into the R.A.F. if otherwise suitable) wear a four-bladed propeller badge as leading cadets; those who pass the advanced training examination wear the star superimposed on the centre of the propeller as senior cadets. In 1956, 5,288 cadets gained proficiency certificates and 973 gained advanced training certificates. Rank promotions to cadet corporal, sergeant and flight-sergeant afford experience in leadership.

A.T.C. cadets enter the R.A.F. in various ways—as Boy Entrants, as Technical or Administrative Apprentices, as National Servicemen, regular airmen; or as officers—some by direct entry, some to the Royal Air Force College, Cranwell, some to the R.A.F. Technical College, Henlow, some subsequently from the universities. A distinctive range of personal R.A.F. numbers denotes entrants from the A.T.C. In 1956, A.T.C. regular entrants to the R.A.F. numbered 1,976 (including 109 aircrew); National Service entrants 2,814 (including 25 aircrew); Boy Entrants and Apprentices totalled 1,092; while 50 A.T.C. cadets entered the R.A.F. College, Cranwell, and one entered the R.A.F. Technical College, Henlow.

Recently, the Corps has been the best source of recruiting the regular entrants whom the R.A.F. most desires. Naturally, the Royal Air Force regards that as the most important aspect of the Air Training Corps. Yet I know of men,

including headmasters, associated with it, who would not lend their aid so readily if they thought its sole object were military. They view its other function of training for good citizenship as at least equally important. This is, perhaps, a question of viewpoint. A good airman is always a good citizen, too. And in my experience of the Corps I have never once heard of a cadet returning from adult service in the Forces who has not been grateful for the training given him in the A.T.C. By its adherence to discipline, physical and moral training, its opportunities for further education, association with the life of the Royal Air Force, its many opportunities for flying, and its outstanding gifts of foreign travel, it is making a contribution through youth to contemporary society of which the full value should become ever more apparent in the years ahead. The earnest of what is expected of him is summed up in the Promise signed on enrolment by each cadet, which reads:

I . . . Hereby Solemnly Promise on My Honour to Serve My Unit loyally and to be Faithful to My Obligations as a Member of the Air Training Corps. I Further Promise to be a Good Citizen and to do My Duty to God and the Queen, My Country and My Flag.

In my experience the A.T.C. cadet lives up to his promise.

DISCUSSION

FLYING OFFICER M. J. GRAY: Can the lecturer tell me why it is that the C.C.F. Squadrons wear battle dress, whereas open squadrons are still having to wear the tunics?

THE LECTURER: That I understand is a question of Air Ministry policy which it is hardly within my province to deal with. But I referred in my paper to the fact that A.T.C. cadets have expressed a desire for the open-neck type of uniform and probably they will continue to express such desires, particularly in the school squadrons of the A.T.C., who also have to wear the high-collared patrol jacket; they do not wear the battle dress. It is only the R.A.F. section of the Combined Cadet Force which wears blue battle dress; and probably the reason for this policy was that the whole Combined Cadet Force begins its first two years, from the age of 14 to 16, in khaki for common basic training, after which C.C.F. cadets express their desire to complete the second period of training, from 16 to 18, in the air, navy or army section. Now the initial issue of uniform for the C.C.F. is as for the Army Cadet Force, that is, the battle dress, with the open-necked blouse, collar and tie. I presume that the Combined Cadet Force, which is run under the administration of the War Office on behalf of the Combined Services Committee, adopted that uniform and will keep to that style throughout, but with the appropriate colour variation for the three advanced sections.

WING-COMMANDER R. C. PRESTON, O.B.E., A.F.C.: I should like to congratulate Wing-Commander Macmillan very much for giving us this extraordinarily interesting account. Coming from rather an outpost Wing, namely Northern Ireland, I have not seen how other Wings operate. My Wing is one which has been chosen to operate the Duke of Edinburgh's award scheme; has Wing-Commander Macmillan any experience of this award? How does he think it is going to operate in his Wing in Cornwall; does he feel that the standards which have been set are within the reach of the average cadet, which after all is what the Duke of Edinburgh's award is for?

THE LECTURER: Cornwall Wing has not been selected as one of the trial areas for testing out the preliminary scheme for the Duke of Edinburgh's award. The nearest A.T.C. Wing to be selected for that purpose is the Plymouth Wing, and I do not know exactly how far advanced they are with their trials. I do know that an A.T.C. cadet of the Middlesex Wing was the first to be awarded the Duke of Edinburgh's award the other day, so it is obviously within the capacity of some of the cadets of the Air Training Corps. But having discussed it with regard to all the terms laid down for the award, we have come to the opinion that the standards set are quite high, probably above the average cadet to-day; and we assume that that is the purpose of the scheme. Its purpose is surely to set a fairly high standard which cadets must strive to attain, not to set a low average standard which every cadet can achieve. If its object is, as I understand it, to improve the youth of the country in the various matters which have been set as parts of the items required for the award, then obviously the standard must be beyond the average cadet, otherwise it would not achieve its purpose of raising the youth standard to a higher level than at the present. I do agree that many cadets to-day would not be able to reach the standard that has been set.

FLIGHT-LIEUTENANT B. LAWRENCE REES: I would like to endorse, from the many years I have served with the Air Training Corps, everything that has been heard and said this afternoon. I was on one of the first parades which was inspected by the then Chief Commandant of the Air Training Corps and I have found from experience that we really still have a fine organization.

AIR VICE-MARSHAL WILLIAM MACNEECE FOSTER, C.B., C.B.E., D.S.O., D.F.C.: I, too, should just like to endorse very strongly one comment that the Wing-Commander has made; and that is the extraordinary value to the nation as a whole in the training of these boys. Only a short time ago I saw the Chief Constable of Oxford, where I am chairman of two committees, and he told me that, to the best of his belief, during the last 14 years there had not been a single Air Training Corps cadet brought up before the bench. I think that is a most remarkable statement, and one which amply endorses what Wing-Commander Macmillan has said. I am very glad to hear that the view of the Air Council is that the dual purpose of the Air Training Corps should be maintained; that it should primarily be a source of recruiting for the Royal Air Force, but without losing sight of the benefit it is to the youth of the nation as a whole.

WING-COMMANDER J. L. IRELAND: I should like to ask Wing-Commander Macmillan if, after all these years, he feels that the sporting activities which play such an important part in the life of an Air Training Corps cadet should still be entirely supported at squadron and Wing level from sums raised by voluntary contributions?

THE LECTURER: As far as my own Wing is concerned I would not like to see it otherwise. I personally feel that we should not spoon-feed the cadet with everything. A certain amount of self-help helps to make a better Corps, a better Squadron, a better Wing, and I think that if everything were provided absolutely free, without any contribution at all locally, we would lose a very valuable local stimulus. The Cornwall Wing is a very prominent Wing in sports and games, and very successful in that branch of its work, and I must say that we find no difficulty whatever—although we fortunately have certain very good friends. For example, we get a contribution from the County Rugby Football Club which helps us in rugger, and we get other assistance of that kind from the County. I personally do not think that we should expect any assistance from public funds for our sporting activities. We can do them on our own, I think, even better. At the same time I would also like to say that we do get assistance in many ways because many of our games are held on Royal Air Force Stations. We have the benefit of being able to put up cadets in accommodation where

the charges are absolutely at the minimum; and sometimes it is possible too for courses engaged in to be run together, so that travelling is facilitated in that way. I do not think we should ask for more than we get now.

FLIGHT LIEUTENANT L. G. NIXON: It is appreciated that unless Warrant Officers have had service in the Royal Air Force they should not be entitled to wear the Royal Arms. It is a very sore point with these Warrant Officers that they are not permitted to wear a Warrant Officers' cap badge; a cap badge does not signify rank. Cadets wear the A.T.C. badges, Officers wear the Royal Air Force uniform, but Warrant Officers are labelled with A.T.C. cap badges which they do not like.

THE LECTURER: We have the honour of having with us to-day the Air Officer Commanding-in-Chief of Home Command, who is the present Commandant of the Air Training Corps. Possibly he would care to answer that question.

AIR MARSHAL SIR DOUGLAS MACFADYEN, K.C.B., C.B.E.: I will certainly make a note about that and make enquiries about it. It is new to me and I must say I quite agree with what the speaker says. I will look into it anyway.

FLIGHT LIEUTENANT NIXON: Thank you very much.

THE CHAIRMAN: We have had an extremely interesting afternoon. I do not think we could have had a better person to cover the history and achievements of the A.T.C. than Wing-Commander Norman Macmillan. I was so pleased to hear him mention in his paper that he foresaw a tremendous future for pilots. Just at a time when the press seems to think that everything is going to be done by pressing buttons it is nice to hear from another quarter that that view is not universal. One reads in the newspapers that we are at the dawn of an air age, which I am sure is true: more people will be flying than have ever flown before; new types of aircraft, vertical take-off, helicopters, short take-off and landing jets, and turbo props, are all coming along. At the same time we are told that everything is going to be done by pressing buttons. Clearly that view was wrong and I was very glad, Sir, that you endorsed the view that there is going to be a great need for pilots in the future, and for a higher and higher calibre of pilot with the increased responsibilities which obviously lie in front of us. I was also pleased to hear not only of the training which they receive for the Royal Air Force, but of the training which you, Sir, mentioned that they receive in citizenship. I am sure that is an investment for the future of this country which is thoroughly sound and which will pay dividends. I was at Halton last week and when I asked how many of their cadets came from Air Training Corps I was told that it was nearly half of those who were at present at Halton. That is a tremendous endorsement of all the work which people like you, Sir, have done since the formation of this Corps. I am greatly honoured to be the President of the Air Cadet Council. I think all of us learned new facts and we all thoroughly enjoyed your talk. I knew when I read that you were going to address us that it was going to be extremely stimulating. The very fact that you have attracted, this afternoon, probably most of the people in this country who have a profound interest and knowledge of air matters and in particular of the Air Training Corps, thoroughly endorses the view of all those present that it was infinitely worth while to come to hear Wing-Commander Norman Macmillan. Now in moving a vote of thanks I would ask you to endorse it in the normal manner.

A vote of thanks to the Lecturer was carried with acclamation.

THE LECTURER: Thank you very much. I would like to say that during the time that I have been with the Air Training Corps I have found that, while my purpose has been to educate youth I have found also that it has been on a reciprocal basis; I have been stimulated very considerably in my own adult education by the work that I have had to do.

SIR ALFRED BOSSOM, BART., J.P., M.P. (A Treasurer of the Society): I am sure you would not want our Chairman to go away without saying thank you to him very sincerely for coming here this afternoon. I have no doubt that if he had been in his proper place at the House of Commons he would have been having some very trying questions, which he can handle with quiet ease, as he normally does. Among other difficult matters he is now looking after, as I believe, the most important youth organization we have in this country. I was very pleased to hear him make that remark about the importance of flying. The facts about that are so obvious. You realize that, when they made London Airport, they were expecting by 1960 to have 3½ million passengers. This last year we have got already 3 million and we have a steadily growing demand. Before it is finished I believe the number there will be something in the neighbourhood of 10 million a year at least. That really means that we have got to have a lot of pilots. The Air Training Corps is doing a great work towards that end and I can assure you that when we get our present chairman fully amplifying the Taylor report, which I am sure he is going to do—and I am sure everybody in this room who is at all technical knows about the Taylor report and its good and bad qualities wants him to do—we shall indeed be happy. We shall not have those problems about battle dress and things of that sort which we have learnt about this afternoon. It will all be straightened out for us. I am sure I am speaking on behalf of everyone here when I say thank you very much, Sir. We wish you great success in your Office and hope that you will continue to make great and successful progress.

A vote of thanks to the Chairman was carried with acclamation, and the meeting then ended.

G E N E R A L N O T E S

LIBERAL EDUCATION IN TECHNICAL COLLEGES

A most interesting circular (No. 323) on the liberalization of education in technical colleges has been issued by the Ministry of Education. The circular, which is addressed to local education authorities, correspondents of non-L.E.A. technical colleges, and principals of establishments for further education, starts from the premise that the need for introducing a liberal element into such education is widely recognized, and it goes on to examine ways in which this liberalizing can be achieved. It recognizes the great difficulty of providing time for such purposes in a part-time course, but points out that even in such circumstances, where the introduction of additional courses of a general character is impossible, much can be done by a change in the way in which even technical subjects are taught. For example, in describing a process or technique, the possible social and economic consequences of its use can be touched on. Such a method naturally, implies an alert staff in constant touch with industry and international developments.

Next, of course, the obvious need for the introduction into full-time courses of such subjects as human relations, art, literature, and languages is stressed, together with the great value of the tutorial system in promoting interest in such subjects and the desire to pursue them for their own sake. Inevitably, this would require a loosening of the rigid schedule of classes and laboratory work of technical colleges, and it is perhaps to be asked how the time for tutorials, and use of libraries, is to be made available? In the last event it must, it would seem, depend on the attitude of examining bodies, and the circular mentions the encouraging move made in this direction by certain professional institutions. Industry, too, can play its part by stressing its need for recruits having a broad outlook, and able to cope with problems not narrowly confined to their own technologies.

MAYFLOWER MEDAL



The medal illustrated here was designed by Mr. Paul Vincze to commemorate the goodwill visit of *Mayflower II* to the United States of America, as part of the celebrations of the 350th anniversary of the founding of the colony at Jamestown, Virginia. Copies of the medal are available to the general public, and all enquiries should be addressed to: The Mayflower Project, 72-73, The Wool Exchange, Coleman Street, London, E.C.2.

It is of interest to note that Sir Alfred Bossom, who has been designated by the Council of the Society as their Chairman for the year 1957-58, is one of the four Trustees who are to take charge of the residue of the fund raised by the Mayflower Project to finance the voyage of *Mayflower II*, to be used to provide scholarships for interchange visits of British and United States students between their respective countries.

MODULAR CO-ORDINATION AND THE COMMON BRICK

In 1954 the Council of the Modular Society, which aims to reduce the cost of building by promoting the development of modular co-ordination, adopted provisionally for its own work a four-inch module, and has supported its use for building development generally. In view of the fact, however, that the common British brick still used by about half the building industry as its prime material is not related in any simple way to a four-inch module, it has been decided that the brick should be accepted as it is for the present, and that the size of components for brickwork should continue to be related to the size of the brick.

The Council of the Modular Society still feels that the four-inch module should form the basis of future building standards, and codes of practice associated with it, but that the more flexible approach embodied in their new policy offers the best prospect of obtaining dimensional co-ordination in the future.

OBITUARY

SIR QUENTIN CRAUFURD

We record with regret the death, in Kent on 8th May, of Captain Sir Quentin Alexander Craufurd, Bt., R.N. (retired), at the age of 82.

In 1907 he invented the ship-to-ship radio system, having become interested in the possibility of radio telephone while serving on the *Vulcan* in 1901. He was for many years Secretary of the Dungeness Lifeboat Society, whose Gold Medal he held. He succeeded his brother as sixth baronet last January.

Sir Quentin was elected a Life Fellow of the Society in 1926.

SIR ALFRED HERBERT

We also record with regret the death, on 26th May, of Sir Alfred Herbert.

Alfred Edward Herbert, K.B.E., was born in 1866, and educated at the Stoneygate House School. At an early age he formed his own firm, Alfred Herbert Ltd., at Coventry, and this enterprise developed into one of the principal units in the machine tool industry in this country, with large subsidiary interests overseas.

In the First World War he served at the Munitions Ministry as Deputy Director-General and later as Controller of Machine Tools, while in the last War he was appointed Honorary Colonel of the 59th Searchlight Regiment of the Royal Artillery (T.A.). He was created K.B.E. in 1917, and had received also a number of foreign honours.

Sir Alfred was at one time president of the Machine Tool Trades Association, but he devoted himself mainly to the affairs of his own company, at whose headquarters in Coventry he spent three days a week even in his ninetieth year. He was a generous benefactor of the city of Coventry, of which he was a Freeman, and gave £200,000 towards the Art Gallery and Museum of the city.

Sir Alfred was elected a Fellow of the Society in 1941.

MR. LEONARD HOWLES

We also record with regret the death, in hospital in London on 14th May, of Mr. Leonard Howles.

Leonard Howles, C.B.E., M.I.Struct.E., M.I.E.E., was born in 1896 and was educated at Smethwick Technical College. From 1919 to 1935 he was with the Shropshire, Worcestershire, and Staffordshire Electricity Power Co., and then until 1948 with the South Wales Electric Power Co., of both of which he was General Manager. He was a member of the Central Electricity Authority, and since 1948 had been Chairman of the South Wales Electricity Board. He was created C.B.E. in 1951.

Mr. Howles was elected a Fellow of the Society in 1938.

MR. OWEN MOCATTA

We also record with regret the death, in London on 17th May, of Mr. Owen Mocatta, at the age of 74.

Owen Mocatta was a member of a family prominent in the Anglo-Jewish community and in the congregation of the West London Synagogue, of which he was himself president. He was head of the firm of Mocatta and Goldsmith, and his public interest was mainly in the Jewish Historical Society of England, of which he had been Honorary Treasurer, and the Joint Mocatta Library Committee of the Jewish Historical Society and University College, London, of which he was chairman.

He was elected a Fellow of the Society in 1906.

DR. N. E. RAMBUSH

It is with regret that we also record the death, on 15th May, of Dr. N. E. Rambush, at the age of 68.

Niels Edward Rambush, D.Sc., was born in Denmark and educated at Copenhagen Technical School. In 1911 he came to London, and became a partner in the firm of Arthur H. Limn and Rambush. When that firm was bought out by the Power-Gas Corporation Limited, Stockton, Rambush became chief engineer to the Corporation

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at Stockport and later technical manager; at the time of his death he was its chairman and managing director. In 1948 Durham University recognized his services to science and local industry by conferring on him the honorary degree of Doctor of Science.

He was elected a Life Fellow of the Society in 1950.

NOTES ON BOOKS

THE CALLIGRAPHER'S HANDBOOK. Edited by C. M. Lamb. Faber, 1956. 30s

It is too seldom remarked that, whereas the art of the delicately stippled miniature portrait has sadly declined since its great ages—a decline hastened, no doubt, by the now ubiquitous framed photograph—at the same time the art of the scribe and illuminator has enjoyed a notable revival in recent times. Mainly that has been due to a single inspired craftsman, Edward Johnston, of whose classic work *Writing and Illuminating and Lettering*, first published fifty years ago, we were reminded in a recent exhibition in Hay Hill assembled by the Society of Scribes and Illuminators.

A number of the more prominent contributors to that exhibition, all acknowledging their debt to Johnston, have contributed technical essays to the handbook under review, which usefully supplements, as well as commemorates, the master's volume. Thus Mr. Sydney Cockerell writes with point and elegance on the binding of manuscripts, out of his ripe experience; Miss Dorothy Hutton, in a necessarily more formal and tabulated paper, describes the illuminator's methods and pigments; while Mr. Alfred Fairbank, in the course of his essay on cursive handwriting, recalls the valuable assistance Edward Johnston gave him in 1932 in preparing the paper on the teaching of handwriting which the Royal Society of Arts heard from Mr. Fairbank at that time.

There is perhaps no need to enumerate the other contributions to this comprehensive and admirably illustrated volume, for the list may be seen at a glance on the flap of the copy now available in the Society's Library for all Fellows who are interested in this fertile field of lettering, formal calligraphy, and illumination.

NEVILLE WALLIS

CORRIGENDUM

We regret that in the list of newly-elected Fellows published in the last issue of the *Journal*, the surname of John Jarrett Davis, of London, was incorrectly given as 'David'.

FROM THE JOURNAL OF 1857

VOLUME V. 12th June, 1957

EXAMINATION FEVER

Quoted from the Leeds Mercury

The interest taken by the working classes in the Competition [the Society's examinations] is very great. As evidence of this, a candidate from one of the Lancashire towns was attended to the train, on his departure for Huddersfield, by a number of his fellow-workmen and friends, who by many a hearty phrase and kindly gesture cheered him on in the great struggle on which he had entered. On the nights of the previous examinations the lobbies of the Huddersfield Institution were crowded by the candidates eager to learn the issue, and those from a distance who had passed the ordeal were soon busy writing brief but fervid despatches to their friends.

(In their earlier years the Society's examinations were in part oral, and in 1857 they were held both in Huddersfield and in London.)